International Management Digest®

JULY 1959
ONE DOLLAR (U.S.)

THE McGRAW-HILL PUBLICATION OF WORLD BUSINESS INFORMATION

Etienne Hirsch: Europe's atomic program is only "a small attack on a big problem"—page 11

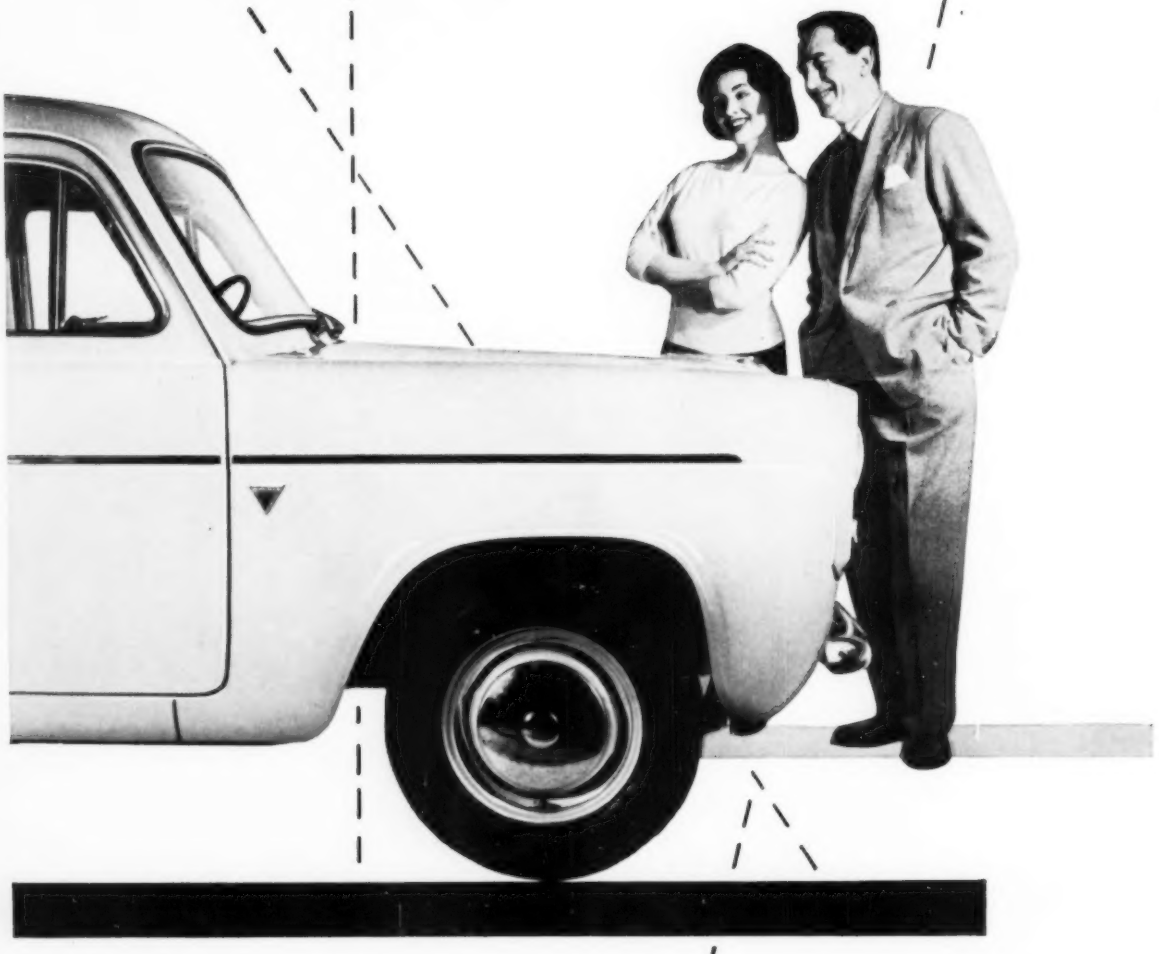
L.A.

What the modular office looks like—page 24

We like that

ANGLIA

style . . .



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LOOKING AHEAD — World Affairs

Another Look at Latin America

Belatedly, businessmen are beginning to appreciate the significance of the revolution that is sweeping Latin America.

Changes there have been comparable in scope—if not in dramatic impact—with the Chinese, even Russian revolutions. The differences: Latin America's revolution has been piecemeal, and it has been democratic.

The business outlook for Latin America must be weighed against the background of this revolution.

To define what has happened: Note the trend toward industry and city-dwelling. This has upset the traditional balance of power, if not influence of accumulated wealth, of ruling military and landed aristocracies. In their place two potent forces are emerging: the businessman-manager (see Management Methods) and the industrial worker.

Though often far apart in philosophy, these groups reflect the basic factors underlying present Latin American unrest. One is the craving to broaden the popular role in government. The other is the economic desire to expand, diversify, profit—and to raise living standards.

To define the present situation: Economic growth has been slowed in many Latin nations by recession abroad and inflation at home. In the face of exploding population (page 9), this produces intolerable strains.

On the political side, revolutionary change has given free rein to democratic hopes—and, at the same time, easier access to influence for Communists and other anti-democratic forces. The democratic leaders of Latin America are today more worried about these troublemakers than they will publicly admit.

Conflicts set in motion by these changes help explain Latin America's approach to current economic problems. For example:

Foreign investment: There appears to be a wide divergence. Argentina recently has attracted and welcomed important amounts of new capital, private as well as public. Brazil has a quite open door—but there is growing ultranationalist clamor against foreign investment. Cuba has just frightened investors with agrarian reform, and hints of nationalizations.

Yet if extremists do not get the upper hand, the outlook suggests that more private foreign capital will be welcome in the next few years. But it must be accompanied by public financing for less profitable projects. Fortunately, there is promise that such public capital will be available.

Commodity stabilization: Nearly all Latin Americans agree on the need for commodity stabilization schemes. The U.S.A. is veering further away from its traditional opposition, and stabilization progress can be expected. But thoughtful Latin Americans realize that they, not the rest of the world, are the only ones who can solve their raw materials problems.

Trade: Latin Americans realize too that they must increase trade among themselves. In a few years, the world will see free-trade area experiments under way among several groups of Latin nations. The problem: Industrializing lands are loath to reduce the protection granted new factories. So progress will be halting.

Economic development: There are hopeful trends toward more realistic, better-balanced, financial management in most Latin American capitals;

but in each case, the government is hard pressed by unfavorable popular reaction. Indeed, Brazil has rejected a badly-needed international loan agreement because the internal fiscal reforms demanded by the International Monetary Fund as a quid pro quo are deemed politically impossible.

In sum, the fact that Latin American countries share political and economic problems that grow from common seed does not make them any easier to solve. But many observers see evidence this year that Latin Americans will work together more closely in attacking the problems.

Bright Outlook in Europe

Producers of primary materials may get help from what is happening in Western Europe. A major economic upturn is on its way.

Economists of the Organization for European Economic Cooperation recently estimated that Western Europe's gross national product will go up 3% this year. Here are some further OEEC forecasts:

—Total industrial production for the 17-nation area in 1959 will be 4½% to 5% above 1958.

—Imports into the area will rise by 5%.

—Production in West Germany, Italy, and the Netherlands—already moving at a sharp pace—will rise 6% to 7%.

Britain has been moving a shade slower, but all signs point to a robust recovery. Exports in April were the highest since May, 1957. And British consumers are buying. Retail sales are up as much as 6%.

Even more significant, orders for machine tools late in May for the first time in many months were running ahead of current deliveries. Total industrial production in December was expected to be 4% to 5% above a year earlier, *The Economist* stated.

A "Buy Foreign" Craze?

The U.S. consumer is taking a new interest in imported products. His enthusiasm at the recent U.S. World Trade Fair made this clear. More than half a million visitors flooded New York's Coliseum to look at the wares of 63 nations—and many bought or ordered.

Trade buyers numbered 162,000, topping last year's attendance by 12%. And they used their order books. Italy reported a sales increase of 19% over last year, Czechoslovakia a 100% increase. Luxembourg's Sivia sold so many refrigerators that it plans to open a U. S. plant.

Heightened interest in foreign goods also is evident at U.S. department stores and specialty shops, the N. Y. *Journal of Commerce* reports. These outlets expect to import 10% more merchandise this year. They are sending more buyers to Hong Kong, Morocco, India, as well as to Europe.

The U. S. Big-Small Cars

By the end of the year, the three big U.S. car makers—General Motors, Ford, Chrysler—will have launched their Corvair, Falcon, and Valiant. These are the long-planned "smaller" cars, said to be sized between a regular low-priced U.S. car and such models as Volkswagen and Renault.

Detroit makers are uneasy about how well these cars will do. The cars will sell for only a little less than Chevrolets, Fords, and Plymouths. But they will be cheaper to run. And they will offer more "class" and comfort than most imports.

The hope is that new car will appeal to the U.S. buyer who wants a smaller car—and to buyers overseas who want added luxury.

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JULY 1959
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International Management Digest.

IN THE WORLD THIS MONTH

Europe Juggles the Atom. Promises and doubts about the future of atomic power.....11

Big Surplus. Washington threatens to unload its huge stockpiles of raw materials.....13

Japan Pushes Petrochemicals.....13

World Air Freight Continues to Climb.....13

Students Go to Work Abroad. Trainees spread goodwill, bring home foreign know-how.....15

MEN AND COMPANIES

U.S. Steel's Dilemma. If it raises prices, it is damned by Washington; if not, by competitors..16

BP on the March. A drive for petroleum markets 16

In Brief 17

TECHNOLOGY

Looking Ahead. News about explosive forming, no-nail shoes, machine translation.....18

Today's Best Plants Are Built for Tomorrow. They are easy to maintain, easy to expand.....20

More Solids Go by Pipeline. Chemicals, coal, even grain and wood pulp, soon will be piped.....22

Why U.S. Firms Buy Abroad.....22

Computer Directs Gasoline Making. Full automation is here for the petroleum plant.....23

A Shield Against Corrosion. A new technique puts a skin of aluminum on steel, cast iron.....23

MANAGEMENT METHODS

Office Layout Goes Modular. The advantages are greater efficiency and flexibility.....24

How Work Measurement Is Used. A new survey turns up some interesting data.....26

Problems Facing Latin Industry. Professional managers are setting out to solve them.....27

Useful Guides for Training Managers.....27

MARKETING

This Small Company Thinks Big. It set up a marketing organization in 90 days.....28

Two Types of Customers. A mail-order company opens up a "second sales front".....30

Consumer Contests Are Gaining Favor. Even conservative firms are handing out prizes.....31

Scientists Unveil Product's Talents. How new markets were found for a tiny bead.....32

In Marketing 32

FINANCE

How a Continuous Process Plant Set Up a Standard Cost System.....37

Financial Digest 41

DEPARTMENTS

World Affairs 1
Reader's Page 6
Charts of the Month..... 9
Product Digest 42
Management Reading 43
Personal Affairs 44

PICTURE CREDITS: European Community Service—cover; Fabian Bachrach—p16; Marc Neuhof—pp24, 25

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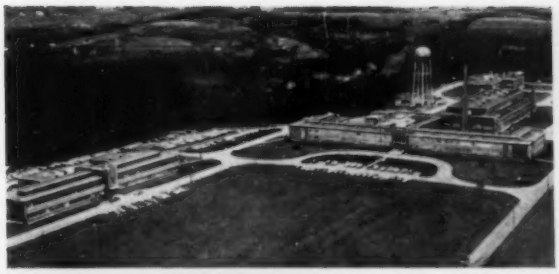

Steel research widens your world . . .

Everybody likes to look ahead, and that includes the people of United States Steel. In the Monroeville, Pennsylvania, Research Center, as well as in U. S. Steel plants across the U. S. A., projects are under way to develop new steels that will deeply influence future industrial progress around the world.

Among the interesting developments is a missile steel with a tensile strength level of 280,000 pounds per square inch, or six times greater than that of sheet steel used in automobile bodies and fenders.

Such research in the past has yielded specialized steels like USS "T-1"* quenched and tempered steel; USS Cor-Ten* Steel, a high-strength, low-alloy steel; USS Tri-Ten* Steel, which permits weight reduction through great strength and toughness; and USS Man-Ten* Steel, offering high strength and weight reduction to situations calling for moderate forming.

Their importance is already being felt through world-wide application. USS "T-1" Steel, for example, has been specified for major penstock installations in hydroelectric developments in Canada, Norway, Switzerland and India.

To produce more and better steels, U. S. Steel has spent almost four billion dollars since 1945 on improving facilities and adding new ones. It intends going right ahead adding new facilities and improving existing ones.

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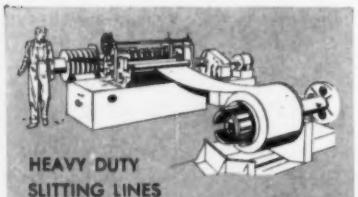

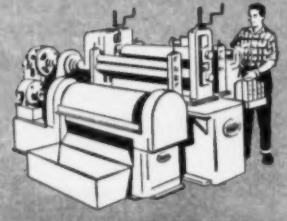

ENGINEERING YODER MANUFACTURING ROTARY SLITTING LINES

● THE EDITOR'S PAGE

'There Are No Hula-Hoops!'

A short lesson in comparative economics*

The scene: Office of the Eastern Planning Committee. An excited little man enters.

LITTLE MAN: All the HO [state] stores say that a thousand people are coming in daily and want to buy Hula-Hoops.

PLANNING BOSS: Crazy! Hula-Hoops are not necessary for the building of a socialist society. There are no Hula-Hoops!

LITTLE MAN: But what if the little children and girls enjoy them so much?

PLANNING BOSS: I am not interested. I am responsible for building a socialist society . . . Hula-Hoops are not included in the plan this year. Tell these reactionaries who believe life should be a pleasure that building socialism is anything but a pleasure . . .

No, better not say that! Say that Hula-Hoops will be available at the earliest in 1960, if by then . . . No! Say that the Hula-Hoop is a typical phenomenon of monopoly capitalism and the reactionary bourgeoisie. Those who ask for Hula-Hoops are committing treason against the People's Democracy.

* * *

The scene: A wholesale firm selling synthetic specialties in the West. Enter a young man.

YOUNG MAN: The boss is furious. Another order for 1,000 Hula-Hoops has been cancelled. Did you see this letter from Diana Department Store? Listen:

> 'Do you really think our customers will wait five days to get a Hula-Hoop? By that time they will have made their purchase at the Meyer Department Store, whose supplier is not as sleepy as yours!'

SECOND MAN: I know what I am going to do. I will call Brussels. Perhaps van Meeren can help us out with a few thousand hoops.

YOUNG MAN: We had better do that. Our German supplier has installed 12 new machines, but he can only deliver next week—and that by working day and night.

* * *

All this because little Doris, age 13, urgently wants a Hula-Hoop and under no circumstances will wait until Monday. Shouldn't someone spank her and explain that we got along very well without Hula-Hoops when we were young?

No. Because Doris is not asking for anything else but what a free economy accomplishes daily.

The Hula-Hoop is a typical case. It started overnight. All of a sudden hundreds of thousands wanted Hula-Hoops. Suddenly they were here—without planning committees and production activists. . . . Competition is a great taskmaster and a constant stimulus.

---

* *Adapted from "Mit beiden Füssen auf der Erde", a booklet published by Gemeinschaft zur Forderung des Sozialen Ausgleichs, a management-sponsored organization for the promotion of labor-management relations, and the free economy, in West Germany.*

SINCE 1856
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Mining equipment, Ore dressing plants, Cement factories, Non-ferrous metal smelting plants, Coal washeries, steel construction, Structural steelwork, Steel bridge construction
SINCE 1864
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SINCE 1864
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How to Use Power More Efficiently . . . Idea #8

Air conditioning maintains peak productivity in all seasons. It increases employee efficiency and work output.

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There are two basic air conditioning systems to choose from —central and packaged. *Central systems* are built from individual components carefully selected to meet the special requirements of a particular plant. *Packaged systems* are self-contained units, and are usually spotted in strategic locations throughout the plant.

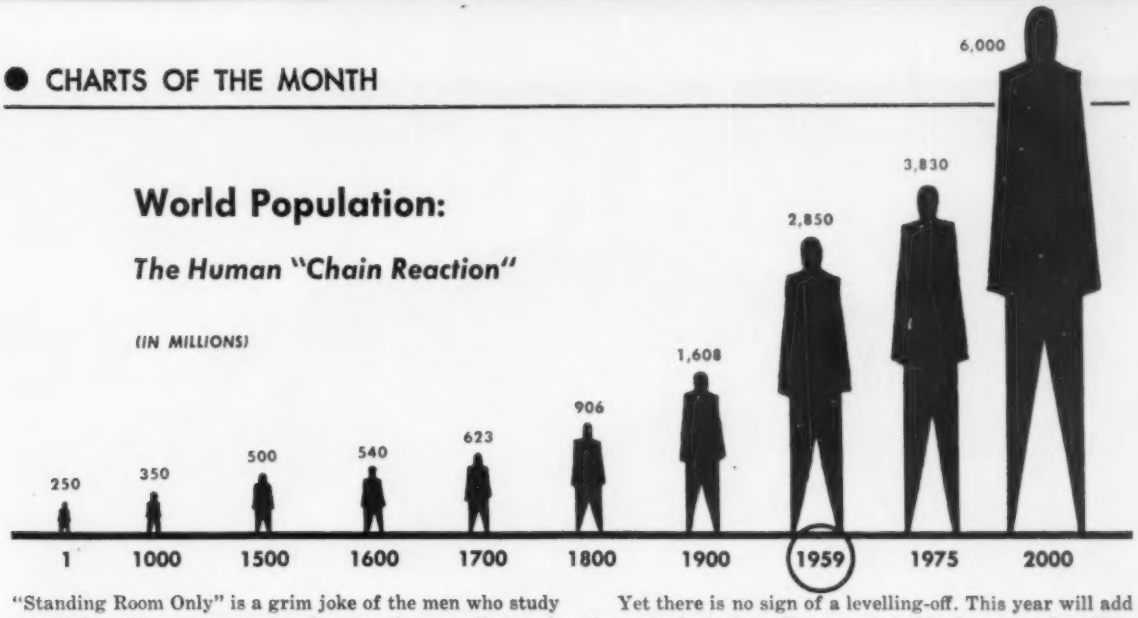
For further information on how air conditioning can help increase your plant productivity, and to receive a copy of Worthington's "Power Planning Guide," which includes nine ideas for more efficient power use, write to Worthington Corporation, Dept. 107-18E, Harrison, New Jersey, U.S.A.

WORTHINGTON

World Population:

The Human "Chain Reaction"

(IN MILLIONS)

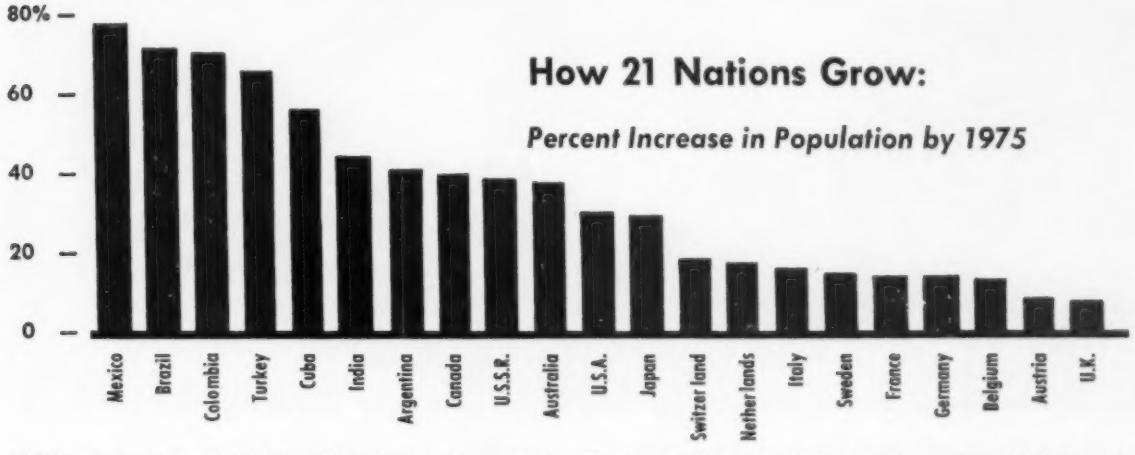


"Standing Room Only" is a grim joke of the men who study population. Given present growth rates, they say that each human will have but one square meter to live on in 600 years. Obviously that is impossible: Man will control his breeding or catastrophe will do it for him.

Yet there is no sign of a levelling-off. This year will add the equivalent of one France, one-half a Japan, or four New Yorks. By 1995 world population promises to double. Marshalling the resources to support nearly 6,000-million people is mankind's great challenge.

How 21 Nations Grow:

Percent Increase in Population by 1975

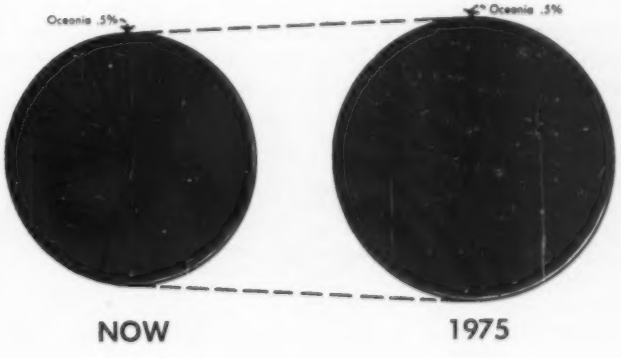


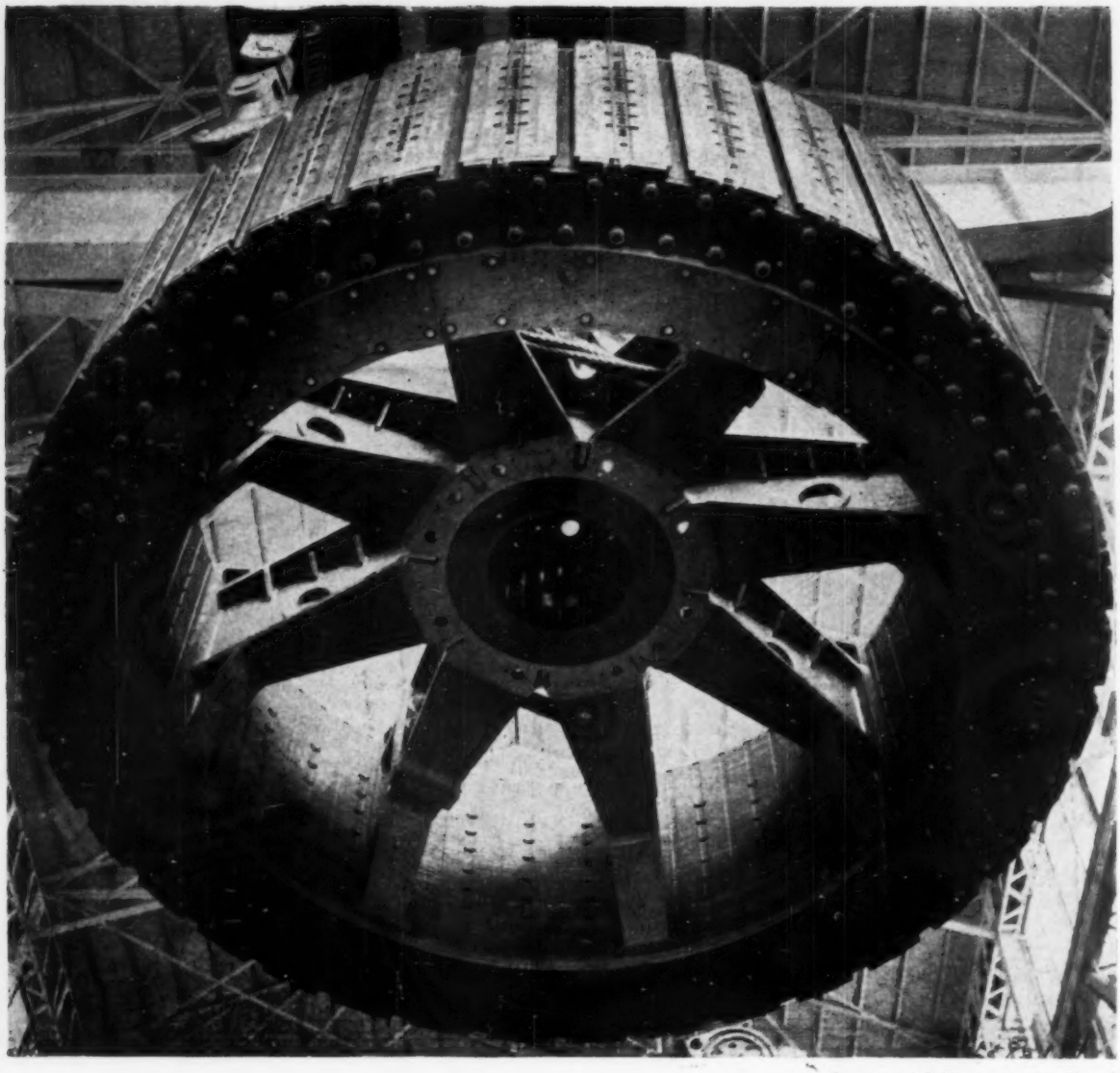
The key to growth, says the United Nations, is the dramatic drop in death rates. For example: Mexico's death rate fell 12.1 per thousand in 1956-57; Costa Rica's by 9.6; Ceylon's 9.8. This trend will continue.

Birth rates usually hold steady: 15 to 22 per thousand in Europe; 23 to 28 in North America and Australasia; into the 30s and 40s in Latin America, Africa, Asia. But there are cases where a dangerously high rate has dropped like a stone: Japan fell from 34.3 to 17.2, Puerto Rico from 42.2 to 32.4, 1947 to 1957.

How Population Distribution Will Change by 1975

Change in population distribution is inevitable. Today's industrially-advanced areas contain slightly more than one-third of world population. But their share will drop to less than a third by 1975, to a quarter by 2000. Note also changing age structures. Falling death rates mean younger populations: In Latin America, Africa, and Asia 40% of the people are under 15, 6% over 60. In Europe and North America less than 30% are children, 11% over 60. By 1975 the contrast will be greater.





Massive AC Generator for Brazil

CAPACITY 83,000 KVA VOLTAGE 13.8 KV FREQUENCY 60 cps SPEED 200 rpm

The two largest AC generators ever built in Japan for export were completed by Hitachi last January. They were destined for the Paulo Afonso Power Station of Companhia Hidroeléctrica Do São Francisco and situated on Brazil's San Francisco River—the hub of a gigantic hydro-power grid serving northern Brazil with a capacity of 1,000,000 KVA.

These umbrella-type alternators incorporate a number of new developments. The rotor spider, for example, was constructed of welded steel to effect a considerable reduction in rotor weight. A new synthetic resin gives added durability and insulation for the coil. The segmend type bearings eliminate the need of an oil pump. These and other improvements are products of the world's most advanced electro-mechanical technology.

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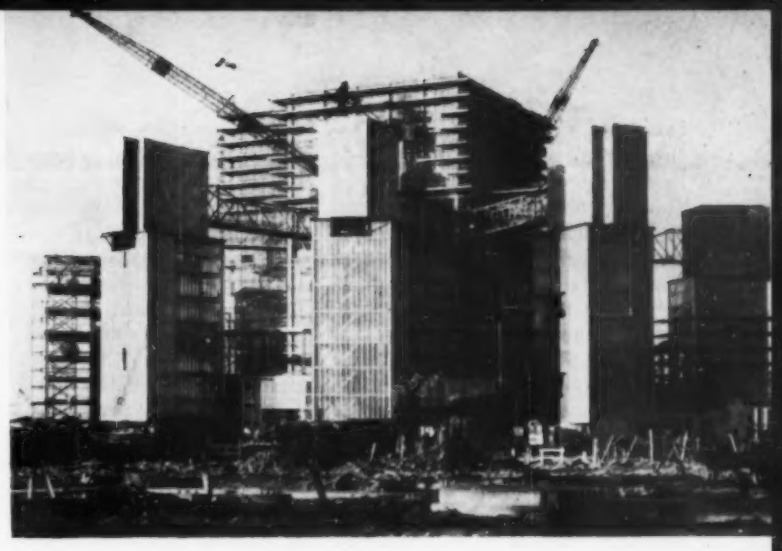


Britain's Hunterston (photo) soon will be adding to the world's nuclear energy. But the program on the continent still wavers, as . . .

Europe Juggles the Atom

THE PROMISE of practical atomic power for the world never loomed larger than today. But caution dominated the recent third industrial conference of the OEEC (Organization for European Economic Cooperation)—the 17-nation group which has the greatest stake in development of cheap atomic power.

Meeting in Stresa, Italy, the 500 OEEC delegates stressed the need for further research, smaller power stations—as a means to technical advances—and Europe's determination to make itself self-sufficient in the design and construction of power stations and in the fabrication of fuel elements.

An OEEC committee laid down a goal of 8.5 gw (8,500,000 kilowatts) of atomic energy for continental Europe by 1965, in contrast to the 15 gw proposed two years ago—and many delegates felt the new figure was optimistic. Aside from Italy, no country felt that its need for atomic power would be urgent in the next five years.

• **Fuel Surplus** — The thinking was in line with Europe's current coal surplus, and the temporary decrease in electricity needs here and elsewhere. The need for atomic energy does not seem as urgent or as immediate as it did only a year ago. But many delegates were aware of the long-range problem; energy needs around the world are increasing by 3% each year, and in industrial countries, by more than 7%.

Within 20 years, says Euratom's new president, Etienne Hirsch, (cover photo), Europe will need as much energy from the atom as it now gets from all sources. The present U. S.-Euratom program, for 1 gw of power by 1963 for the six Common Market countries, Hirsch recently told *Nucleonics* magazine, is only "a small-scale attack on a big problem, aimed at learning more about this new way of handling things."

Utilities and governments, however, are in an understandable dilemma about atomic power. They know that if they wait a year or two, technical advances might make atomic energy cheaper and more attractive. At the same time, they are aware that if they don't get started now with their atomic stations, they won't have sufficient energy resources when they need them—and they won't have needed technical understanding to go ahead with a program.

• **Cost Facts**—Atomic power still comes high. The authoritative London *Economist*, after an analysis of Britain's present and future projects, suggests that the cost of atomic electricity in the next 10 years will inevitably be 20% higher than that from the most modern conventional stations.

Some experts are more optimistic. Aley Allen, of U. S.A.'s Atomic Industrial Forum, Inc., believes that atomic power can be competitive in certain industrial areas with the best of conventional power facilities. Writing in the *Vanderbilt Law Review*, he estimates that electricity from modern stations in Europe and Japan currently costs about 10 to 12 mills per kilowatt-hour and that "electricity from nuclear reactors can undoubtedly be produced right now from in the range of 10 to 14 mills per kwh."

The fact is that no atomic plant now operating can give an accurate picture of electricity costs. The *Economist's* analysis is based on the plutonium-producing stations now in operation at Calder Hall and Chapel Cross and the capital investment going into the four much larger civil stations at Bradwell, Berkeley, Hunterston, and Hinkley Point. Allen's estimates must rely on U.S.A.'s Shippingport, four larger American plants now being built, plus the wealth of technical and economic data being assembled by U. S. manufacturers.

• **Where We Stand**—Five atomic power stations today are generating and selling electricity. The 60,000-kw station at Shippingport was built at comparatively high cost, more as a prototype than as a competitive venture. The other four—Calder Hall and Chapel Cross in England, Marcoule in France, and one in Siberia—all were designed more for the production of plutonium than electricity. None of the five give an accurate picture of atomic costs.

Allen and others are in agreement about one thing—atomic power will not be of much help to

underdeveloped areas in the next few years. A major reason is that the capital cost of such plants is twice that of conventional works, and they have to be big to get desired economies. Also, atomic power plants have to be run at a high load factor, and this is feasible only when they are near a heavily industrialized area.

The U.S.A. and Russia, for other reasons, do not appear likely to rely too heavily on atomic power in the next ten or more years. Though highly industrialized and with adequate capital, both countries also have large inexpensive resources in coal, oil, and falling water. The greatest atomic-power strides clearly will be made in other industrial areas —in Britain, Europe, and Japan.

• **The British Program**—By 1967 the United Kingdom plans to have generating capacity of 6,000,000 kilowatts of atomic power, and to be producing 25% of the country's electricity needs from these plants. The two-reactor plants at Bradwell, Berkeley, Hunterston, and Hinkley Point (see chart)—with the existing units at Calder Hall and Chapel Cross—will give Britain 1,700,000 kilowatts of generating capacity by the end of 1962.

The British are working on four stages of development beyond the above four stations. Industrial groups already are preparing competitive bids on the three "second-generation" plants for Trawsfynydd, Dungeness, and Sizewell. Like the first four stations, these will burn natural uranium and be gas-cooled, but with technical modifications.

Major technical advances are expected to come with the third and fourth stages of development —the AGR (Advanced Gas-Cooled Reactor), and HTGC (High Temperature Gas-Cooled). The AGR system, scheduled to be proved out on a prototype plant in 1962, will yield 5 or 6 times as much heat per ton of fuel as Calder Hall.

With such a program, Britain not only will have commercial atomic power before any other nation, but it undoubtedly will share with the U.S.A. the task of building many plants in Europe and Japan for some years to come.

• **OEEC and Euratom** — OEEC some time ago estimated that its 17 nations, including the United Kingdom, would require 25 gw of atomic power by 1970—a figure not out of line with the new 8.5-gw figure for continental Europe in 1965. Probably half of the 25 gw will be in the U.K., and much of the rest in the six Common Market countries—France, West Germany, Italy, Belgium, the Netherlands, and Luxembourg—banded together under the Euratom program.

Euratom (the European Atomic Energy Community) came into being officially in January 1958. One of its first moves—finalized near the end of the year—was to join with U.S. authorities in a program of six power plants (with a combined generating capacity of 1 gw) to be built by the end of 1963.

The enthusiasm that set the U.S.-Euratom program going last year now has waned, in view of Europe's coal surplus and other factors. Not all of Euratom utilities were ready with their declaration of intent by May 28, as planned, nor did it seem likely they would come across with complete proposals by the September 1 deadline. Site selection, scheduled for December 31, 1959, and the start of construction (April 1960) also seemed farther away.

But there is no doubt that the U.S.-Euratom program will get moving soon, and that it will lead to broader plans. The program is expected to cost $350-million, and will be supported by a $135-million loan from the Export-Import Bank.

Work is going ahead in Europe on several small and medium-size reactors outside of the U.S.-Euratom program. The most impressive are the natural-uranium plants being built at Chinon (chart). A 160,000-kw plant also will be built in northern Italy, under a contract recently signed by U.S.A.'s Westinghouse and Societa Elettronucleare Italiana.

• **Other Areas** — The world's atomic program cannot be gaged by the U.K.'s impressive effort, nor the starts being made in Europe. The U.S.A., though not ready for competitive atomic electricity at home, has four big atomic power plants under construction. Japan recently handed a letter of intent to Britain's General Electric Co. for the construction of a 159,000-kw plant, to cost about $84-million.

And 20 or more research and small-power reactors now are in operation in the U.S.A. and elsewhere. Though many of the countries running them—Brazil, Venezuela, Portugal, for example—cannot think of atomic electricity for the immediate future, they are doing research groundwork for its eventual use.

A large part of the world's program, in fact, is still moving ahead on a research and development level. Every nation in the world is aware that it will need huge amounts of energy in the years to come. And it is a safe bet—with the technical advances now being made—that the cheapest source some day will be the atom, rather than fossil fuels, falling water, or various unconventional sources. ●

Big Atomic Power Plants Now Being Built

Location	Kw. electricity	Completion date	Builder
In the U.S.A.			
Dresden, Ill.	180,000	1960	Commonwealth Edison
Indian Point, N. Y.	151,000	1961	Commonwealth Edison
Rowe, Mass	134,000	1960	Yankee Atom. Elec.
Laguna Beach, Mich.	100,000	1960	Power Reactor Dev.
In Britain			
Berkeley	275,000	1961	AEI-John Thompson
Bradwell	300,000	1961	Nuclear Power Plant
Hunterston	300,000	1962	G.E.—Simon Carves
Hinkley Point	500,000	1962	Atom. Pow. Projects
In France			
Chinon EDF 1	60,000	1959	Elec. de France
Chinon EDF 2	170,000	1961	Elec. de France
Chinon EDF 3	250,000	1963	Elec. de France

Big Surplus

. . . of raw materials may be sold by Washington. World producers and traders are showing increasing concern.

SINCE WORLD WAR II, the U. S. government has been building commodity stockpiles—in order to have a supply of imported strategic materials, to encourage production of others, to support prices of still others. No one expected these vast supplies, now worth more than $8,100-million, would ever come to market except in case of dire emergency.

Now producers and traders in many industrial materials, worldwide, cannot be sure. They face the possibility that the U.S.A.'s huge purchases may come back to haunt them.

• **Breaking the News**—Stockpiles for about 46 items—aluminum, asbestos, rubber, copper, castor oil, coconut oil, manganese, pyrethrum, to name a few—have been running over. Buying has almost stopped. Yet most of the government store is under strict control of the U.S. Congress, and Congress has shown no signs of wanting to sell surpluses.

Several months ago, the stockpile agency informally asked Congress its opinion of a plan to sell 129,000 tons of copper. Congressmen from U.S. mining areas thundered their protests; the repercussions shook copper prices in New York and London. The plan was dropped.

Then, in late May, came a new revelation: that the government was indeed "actively considering" ways of selling about $4,000-million worth of surpluses.

• **New Look**—When stockpiling was begun, all agreed that the U.S.A. could never again go to war without a reliable supply of strategic materials. But now, the idea is growing that the U.S.A. will never again have to fight the kind of war in which many of these materials will be needed. Canada and Britain, it is noted, have already taken steps to reduce their stockpiles.

According to one view, the U.S. might better store food, medical supplies—more useful during and after nuclear war. Others argue that much of the stockpile has been made obsolescent by technical developments. The Treasury Department would like to get back some of the thousands of millions of dollars spent on stockpiling. Meanwhile, industrial consumers and processors of certain materials would love a disposal plan that would drive prices down.

Materials producers will, of course, fight disposal. And it will take time to find some kind of compromise. For this reason—and the fact that the government does not want to disrupt normal world commodity markets—no large-scale selling in the near future is likely.

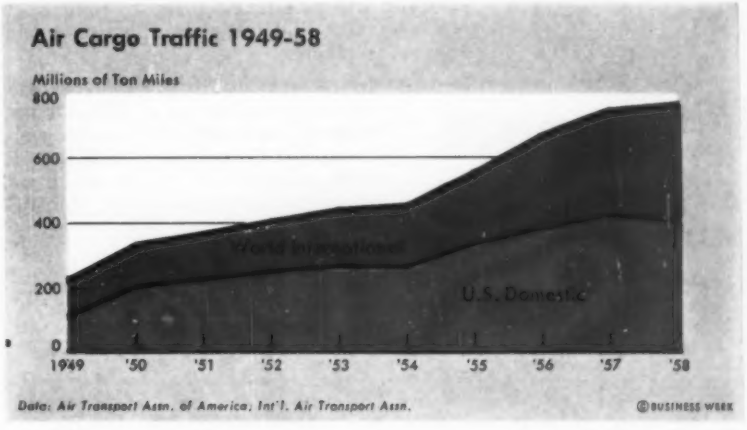
But most observers agree the handwriting is on the wall for the U.S.A.'s huge commodity surplus. Eventually, disposal in one form or another will come. (*Business Week*, *May* 23, p104)

Japan Pushes Petrochemicals

LAST MONTH, no fewer than five new petrochemical plants were scheduled to begin operations in Japan. The aim: more synthetic fibers to push the nation's biggest industry—textiles—in world trade.

There has been a dramatic shift in Japan's petrochemical-plastics position. In effect, Japan has shifted from a buyer to a seller in just four years. *Chemical Week* reports that plastics exports this year may be 65% above 1958.

Japan's first petrochemical five-year plan (begun in 1955) is costing at least $230-million in plant, foreign licensing fees, and equipment. Yet the petrochemical urge among businessmen is still so great that the government worries about possible overexpansion.



World Air Freight Continues to Climb

THE AIR CARGO business keeps growing: Outside the U. S. A.—where it suffered a mild recession last year—air freight has been expanding at an average 18% per year.

Late in May, two American cargo carriers took the step that sets the pattern for air freight in the 1960s. They ordered, from General Dynamics Corp.'s Canadair Division, $80-million worth of CL-44s, a turbo-propeller transport with a capacity of 30,000 kilos, nearly twice that of the biggest air freighters in commercial use today. With greater speed, easy loading, lower costs, the 15 Canadian aircraft are counted on to help the two airlines toward direct rate competition with surface freight.

Despite the surface lines' present rate advantage, air freight grows because it can often mean lower inventory, insurance, and packing costs (IMD—Oct.'58,p44). Renault of France recently revealed that it is now moving spare auto parts to North America almost entirely by air. Renault reports, among other savings, a reduction of approximately 50% in spare-parts inventory levels.

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Students Go to Work Abroad

Trainees are learning foreign skills and spreading goodwill under a growing international student-exchange program.

COMPANIES with an eye to the future are finding a dual road to industrial growth in a student-exchange program sponsored by the IAESTE (International Association for the Exchange of Students for Technical Experience).

By giving summer jobs to technical students from abroad, they are creating goodwill and a climate for their own future foreign expansion. And by helping send their own nationals overseas, they are learning about foreign advances. Students come home with new insight, which they pass on to companies that later employ them.

The IAESTE program was begun in 1948 by universities and companies in nine European countries. Today 26 countries participate, including Poland and Tunisia who joined this year. Over 45,000 scientific and technical students have been given summer jobs during the program's twelve years. About 3,000 companies and universities have aided the exchange.

Last year's 5,394 students came from all member nations but Iceland and India (chart). They found employment in every member nation except Ceylon, in industries covering everything from chemistry and food processing to mining, agriculture, and electrical engineering.

• **Exchange Machinery** — Countries participating in the IAESTE program work through national committees composed of representatives of industry, education, and students' organizations. Their job is to find openings in local industries, and solicit technical students at universities who will be eligible for the program.

Each January committees from all nations meet to exchange offers and requests. They met in Istanbul this year, and in 1960 will convene in Yugoslavia. The IAESTE has no permanent secretary, but acts through national committees.

Nations normally can send only as many students abroad as they find openings for in their own industries. National committees have been flexible about this policy, but the barter nature of the exchange limits their generosity—unless they can offer jobs to the most active nations, they have trouble in placing their own students.

Germany, Britain, and Sweden have been leaders in the IAESTE program. In 1958, Germany found jobs for 1,023 foreign students, and sent 998 abroad; Britain found jobs for 829, sent 774; Sweden found jobs for 736, sent 359.

The U. S. A., which joined IAESTE in 1955, has played a minor role in the work because of competing programs. Over 12,000 foreign technical students, for one thing, currently are enrolled in U. S. universities. Many of these people go to work for U. S. firms during the summer.

• **Steady Growth** — But the IAESTE program has been growing steadily—from 920 students in 1948 to about 6,000 this year—and U. S. companies as well as European are becoming increasingly aware of its special values. A German technical student, for example, is a good salesman for German technology when he works abroad. He also brings a wealth of knowledge back with him.

For companies, the cost of the program is nominal—$100 for each student accepted, plus his living expenses. Students pay their own travel expenses. The IAESTE committee finds students to fit the jobs available, screens the applicants, and submits the applications to the interested companies for their approval. ●

Technical & Scientific Students . . .

from here . . . *found summer jobs here in 1958*

	Germany	U. K.	Sweden	France	Other, Europe	N. America	Other
Austria	142	78	132	35	160	10	5
Belgium	19	12	5	13	18	1	1
Canada	4	8	3	3	5	—	1
Ceylon	—	—	—	—	—	—	2
Denmark	30	31	25	10	44	1	3
Finland	77	13	52	2	29	1	29
France	68	87	29		140	8	11
Germany	..	134	193	85	564	16	6
Greece	38	4	4	3	44	—	11
Israel	—	14	7	5	69	—	—
Italy	47	35	12	17	59	4	3
Netherlands	117	77	23	48	151	16	14
Norway	19	51	26	7	39	5	2
Portugal	9	8	5	15	17	—	1
Spain	47	42	11	30	104	5	5
Sweden	103	126	—	19	103	3	5
Switzerland	21	49	20	9	42	5	5
Turkey	106	22	5	11	85	3	—
U. of S. Africa	—	3	—	—	2	—	—
U. K.	73	—	157	90	382	69	3
U.S.A.	19	7	9	9	37	—	1
Yugoslavia	84	28	18	5	82	—	3
Totals	1023	829	736	416	2176	147	73

U.S. Steel's Dilemma

WALTER MUNFORD (above), the new president of the giant United States Steel Corp., took office two months ago with a powerful spotlight focused on his company—the bitter contract negotiations between the steel industry and the United Steelworkers. Because of its size (almost twice as big as its largest competitor and the sixth largest corporation in the world), its numerous operating locations, its broad product line, and its hard-earned efficiency, U. S. Steel dominates the steel industry's prices, costs, wage contracts.

• **Dilemma**—And because of its dominating position, U.S. Steel's stake in the negotiations went far beyond the effect that wage increases might have on its own operating costs. U.S. Steel's dilemma: whether to raise prices following the wage increases that many observers looked for—strike or no strike—from the start.

On the one hand, the corporation must pay close attention to opinion in Washington, for it is kept under close scrutiny by antitrust lawyers and some Senators who think there is "undue concentration" in the American steel industry. And for weeks, President Eisenhower and his advisors have been insisting that steel prices should not rise in 1959.

But on the other hand, if U.S. Steel does not raise prices, its lesser competitors will be at an even stronger disadvantage—making the corporation even more a target for antitrust investigations. Thus, U.S. Steel has worked itself into a position where it will be damned if it does, and equally damned if it does not.

• **Perspective** — Actually, this problem is more Munford's perspective than his prime responsibility. U.S. Steel is run by a triumvirate: Chairman Roger Blough concentrates on the corporation's "economic image" and its relations with Washington, Munford is the chief operations executive, and finance chief Robert Tyson is the third member.

But Munford takes over with a frustrating knowledge: The better the job he does, the greater the danger his company will face—even to its very existence.

With Munford's selection, U.S. Steel reinforced two company traditions: that the president is an operations man, and that the top officers of the corporation retire at the age of 65 (which gives Munford exactly six years before he must step down).

Munford is a protege of the past president, Clifford Hood, working under him for a generation and following in his footsteps as president of the corporation's American Steel & Wire Division. He later served as Hood's assistant executive vice president for operations; and his last job was executive vice president for engineering and research.

To Hood goes much of the credit for revitalizing a corporation that suffered from sluggishness, lack of modernity, and the complacency that often accompanies overpowering size. At Steel & Wire, Hood concentrated on the highly competitive, low-cost volume that carbon steelmaking demands. He went after improved techniques, plants, and management.

He emphasized not only aggressive selling, but product developments and applications that his customers wanted. That got Hood interested in research, which he continued to emphasize after he became president of the corporation.

• **Emphasis on Sales**—Now, with a "well-oiled" plant and organization, Munford will concentrate even more on sales and product development.

Steel industry experts estimate that perhaps 60% of U.S. Steel's broad output "sells itself." But increasingly, the remainder has to be sold. Steel is facing greater competition from aluminum, plastics, and concrete. And traditional markets must be maintained as well as new markets exploited.

Two years ago U.S. Steel launched a sweeping advertising program aimed at convincing not only manufacturers and fabricators that steel is about the most useful material available, but the public as well.

The problem is that many of the new markets being uncovered are small. They offer "kilograms" of business, and U.S. steel is tonnage-oriented—its equipment, its organization, even its incentives.

Munford's prime task will be to reconcile the new sales approach with the traditional. Like Hood before him, he will count heavily on research, to protect the traditional markets, to make possible effective exploitation of the smaller new markets, and also permit further cost-cutting in tonnage production. In the end, however, his success will depend just as much on Chairman Blough's defense of U.S. Steel's efficiency.

BP on the March

BRITISH PETROLEUM CO., LTD.—which gets 97% of its petroleum from the turbulent Middle East—has weathered a variety of political upheavals in this area for the past 50 years. But today it is taking these dangers in stride, and concentrating on a more imminent problem—ways and means of finding a wider market, in the face of tough competition, a petroleum surplus, declining prices, and the threat of Soviet oil shipments to the West.

Until recently, BP was primarily a producer of crude, and its markets were mainly in Europe and Africa. But it has been building refining and distribution facilities steadily — spending $2,000-million in the past decade—and it now is

setting up sales outlets in the U. S. A. and Canada.

Last October BP signed a broad agreement with U. S. A.'s Sinclair Oil Corp. for marketing its crude, and it may eventually buy out regional retailers and market directly. In Canada, the British giant has opened 400 outlets in a big drive for sales.

Besides a bid for U. S. markets, BP's tie-in with Sinclair may help it enter Latin America, where it currently neither produces nor markets. Latin countries regard BP as a government company—the British government owns 56% of its stock. But, allied with Sinclair, this government share is cut to 28%, and it may mean more BP exploration in Latin America.

BP has been branded as the industry's price-cutter, and criticized for its reliance on cheap Middle East oil. BP undoubtedly makes far less money per barrel of crude than other companies. But in 1958 its net profit was up $23-million over 1957, to $176-million, while the profits of other majors dropped. (*Business Week, May* 23, *p*116)

In brief . . .

FRED COLE of California, a leading U. S. manufacturer of swimsuits, soon will be producing his high-fashion beach attire under license in Britain and Holland, and expanding sales in Europe. Cole swimsuits already are made in Italy, Austria, Canada, New Zealand, Australia, and South Africa. Cole's west coast competitors—Jantzen, Catalina, and others—also are expanding abroad. California swimsuits — designed more for displaying the female figure than for swimming—soon may dominate the world market, the *Economist* states. Their appeal is to style and fashion, factors that influence women of all countries.

KONOSUKE MATSUSHITA, head of Matsushita Electric Industrial Co. (IMD, Feb., p14), is Japan's top taxpayer for the fourth year, *Business Week* reports. He earned $670,000 in salary, stock, and other sources during the fiscal year 1958. Japan's second highest taxpayer in 1958 was Foreign Minister Aiichiro Fujiyama, a leading figure in sugar and trading circles.

Electricidad de Caracas Building, La Guaira • C. A. Tecnomat, installing contractor

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Yttrium Moves into Commerce

Another rare metal—yttrium—has moved from the laboratory into commercial use, and several U.S. firms are ready to supply both the oxide and the pure metal. Yttrium is being tested in microwave amplifiers and infrared detectors, and it is being considered for aircraft, nuclear and metallurgical applications. It has unusual properties—a melting point of about 1500 C, a specific gravity close to titanium—and it forms high-melting oxides that rival those of magnesium and beryllium in stability. (Product Engineering, May 11, p21)

Asia Finds New Uses for Bamboo

Scientists at Japan's Kyoto University report that bamboo can be used profitably in making rayon pulp. With the help of Japanese firms, India soon will build a 30,000-ton-a-year rayon pulp mill using bamboo instead of conifer trees. With the use of native raw materials such as bamboo, India and other Asian nations hope to decrease their imports of costly pulp from Canada and Scandinavia. (McGraw-Hill American Letter, Apr. 25)

Explosives Form Aircraft Parts

Perfectly shaped jet engine parts (photo) are being formed by explosives from tough alloys in something like 15 minutes by U.S.A.'s Ryan Aeronautical Co. Making the same parts by conventional methods used to take 8 to 10 hours. The part to be formed is placed in a die and the assembly is immersed in a water-filled pit. An explosive charge placed in the die forces water against the parts at speeds of 60 to 150 meters per second. By this method, Ryan can form hemispheres, bell shapes, corrugations, embossments, and other complex shapes. (American Machinist, Apr. 6, p120)

Machine Translation Gets Closer

The U. S. National Bureau of Standards is making important advances in translating Russian into English by machine. A translation scheme recently developed instructs a computer in the combination of English equivalents of the Russian words in a given text with due regard for the meaning of the original. By proper programming, the machine takes into account the grammatical, syntactical, and lexicological properties of words in their context, and groups them into meaningful sentences in English.

Tires That Never Burst

The search for "blowout-proof" tires has led researchers of U.S.A.'s American Latex Products Corp. to filling tire casings with a flexible polyurethane material instead of air. Tires filled with the foam have been punctured with bullets and cut with a power saw (photo), and then driven over both concrete and gravel roads without notable loss of stability and riding comfort. (Business Week, April 18, p 83)

Rubber Pads Serve French Bridge

Pads made of neoprene will take the place of metal support-bearings on the new Tancarville bridge crossing the Seine River above LeHavre. The synthetic-rubber pads will be sandwiched between concave and convex sections of concrete, and will serve to absorb movement in the bridge's abutment. Neoprene pads have been used on other French bridges, but they have simply been placed between girders and piling, without housing between concrete sections. The Tancarville bearings are 2 meters wide, 3.6 meters long, .95 meters high, and can support 10,000 tons.

Magazine Plays Back Sound Effects

A page of the May issue of the popular Japanese magazine Asahi Science gives off sound effects when it is placed in a machine called a Synchroreader. The page—showing photographs of Niagara Falls and London's "Big Ben"—has been impressed with a recording in magnetized-iron ink, an invention of Professor Yusashi Hoshino. When put into the Synchroreader, it renders the sound of waterfalls and of Big Ben striking. According to the *New York Times*, three major Tokyo printing plants have been equipped with Dr. Hoshino's process. Printing a magazine with sound costs about 3 cents a page. Dr. Hoshino hopes to be able to print entire textbooks in sound, and use the process in the teaching of music and languages.

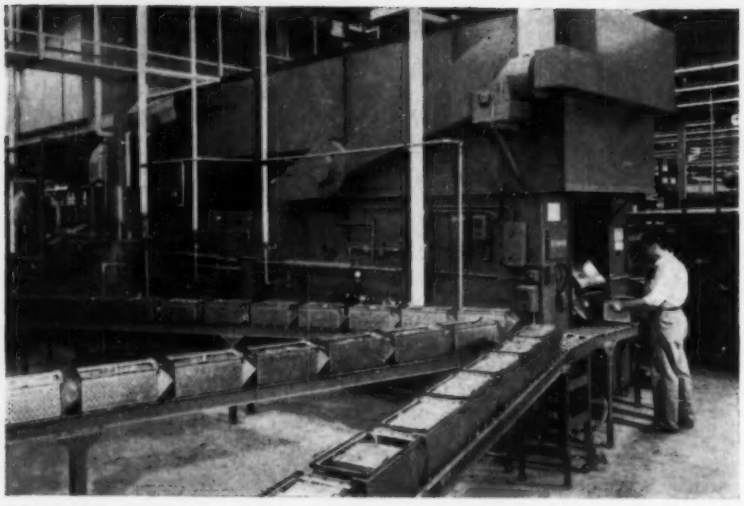
Technique Makes Complex Aluminum Parts

Lateral impact extrusion, developed by Aluminum Corp. of America, adds a new dimension to promising techniques now being used for fabricating aluminum parts. Impact parts normally are produced by metal flow around a punch, down into a die, or a combination of both. With lateral extrusion, metal can flow outward at any angle from the direction of the impact stroke. The process means instantaneous fabrication of such complex shapes as faucet handles and the hub and spokes of a steering wheel.

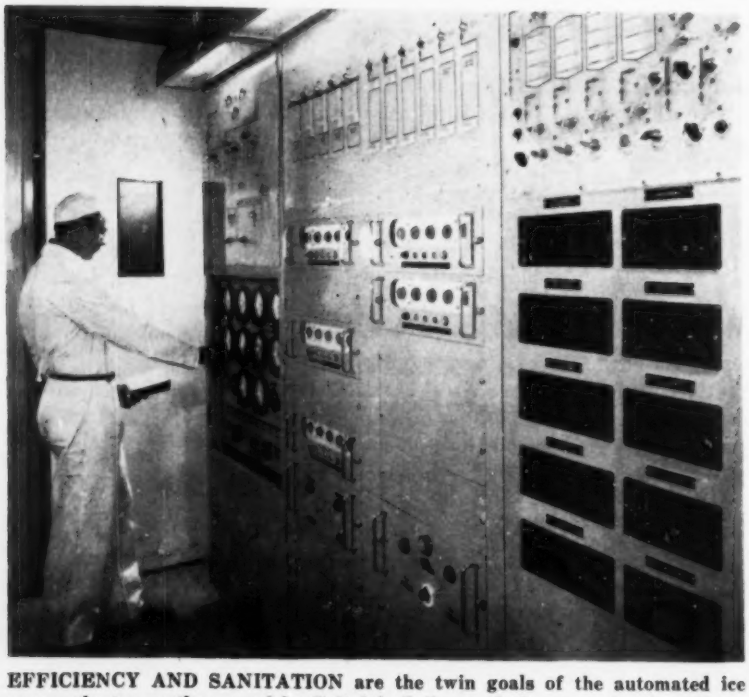
Storage Under a Parking Lot

Putting an oil tank underground (photo) will serve two purposes for the Los Angeles tire plant of the U.S. Rubber Co. Employees will have needed parking space for their cars, and the company will have storage for a four-months supply of fuel oil. The circular tank has prestressed concrete walls, measures about 30 meters in diameter, and holds about 1.3-million gallons of oil. Two submerged pumps transfer the oil to small tanks for immediate use. (Factory, April, p 120)

Today's Best Plants Are Built for



BIG BAYS, high ceilings, strong floors, give layout flexibility to the 575-man factory of U. S. A.'s Square D Co. Making motor controls requires a variety of manufacturing steps, many work centers. Modern conveyors of all kinds speed parts through machining, painting, wiring, testing. The plant is long and narrow, with most services at the front, and the rear designed for easy expansion. The company's slogan is: "Be ready for the boom when it comes."



EFFICIENCY AND SANITATION are the twin goals of the automated ice cream plant recently opened by Britain's J. Lyons & Co., near London. From the instrument panel, above, one operator controls receiving, raw materials flow, and mix-making procedure. Processing is on the second floor, so that food will not be contaminated by auxiliary equipment. Switches on control panel start an automatic cleaning system after the plant is closed, flushing sterilizing agents, detergents and rinse-water through the plant's piping.

Factories now being built combine beauty and function and are easy to run, easy to maintain, easy to expand.

BETTER PLANNING and better equipment feature the factories now being built in the U. S. A. and elsewhere. The exteriors find grace in a wide variety of new building materials—aluminum panels, glass, colored plastics—and take advantage of the special charm and assets of their physical surroundings.

The interiors show the fruits of modern technology, automation, the latest in handling methods. These factories are spacious without waste of plant area. They are easy to operate, easy to maintain, and easy to expand as business increases.

• **The Best of 1959**—Shown here are interior details of five of these modern factories. They represent a broad cross-section of industrial life—pharmaceuticals, machine tools, ice cream, bearings, motor controls. The three in the U. S. (Square D, Stuart, Miniature Precision Bearings) were judged by *Factory* magazine as being among the Ten Top Plants of 1959. Argentina's Perdriel was featured in the Modern Plants Issue of *Ingenieria Internacional Industria,* and the Lyons ice cream plant, in *Food Engineering.*

Beauty and utility go hand in hand in each of these five factories. The Stuart Co., for example, has turned the exacting needs of drug manufacture into elegant and efficient work areas of pastel-colored walls, fluorescent lights, spotless floors (photo, top right). The Square D Co. has a building with generous lawns, a cafeteria that looks over a water-supply lagoon (in place of an unsightly water tower), but office space and in-process storage are kept to a minimum by intelligent planning and the use of modern handling equipment.

• **Site Planning**—Building a factory begins with selection of a

Tomorrow

site. And this involves a multitude of factors, many dictated by the nature of the business. *Factory* suggests careful and patient analysis of these factors, and proper consideration of alternative sites before going ahead. The magazine makes these added suggestions:

--Be critical of all findings when shopping for a site.

—Make sure that the supporting services you will need are available close by.

—If water supply is a problem, put down a test well before going ahead. You will save your company many headaches later.

—Recheck all vital facts, such as water supply, fuel supply, electrical power, sewage, transportation.

—If moving far from your present location, make a thorough study of the new locality's cost of living, taxes, housing, schools.

• **Eye to the Future**—Today's top factories are designed to be thriving concerns 10 or 20 years from now. They use the most advanced ideas in automated tools and materials-handling equipment —specialized conveyors, monorails, traveling cranes, semiautomatic lift trucks.

And smart planners ask themselves these future-oriented questions: Is there space available for expansion? How costly will it be to add a new wing, extend production lines, increase office space? Can production continue while the plant is being remodeled for expansion?

Miniature Precision Bearings (right) has solved these problems with a factory that is set at an angle from the office wing, and the two connected by a cheerful corridor-lounge. As a result, the office area can be lengthened with no crowding of the factory's space. And the manufacturing area can be "doubled in days", the building's designers say, by expanding to the rear or either side. And production can continue with almost no interruption while alterations are being made. ●

WORK AREAS and offices alike are spotless, efficient, streamlined, in this 160-man pharmaceutical plant of the Stuart Co., California, U. S. A. For quality control, the plant has practically created its own environment. The building is air conditioned, for comfort and for process. Some rooms are dehumidified.

MODERN TOOLS from the U. S. A. and Europe went into the "jewel of Argentine industry"—Talleres Perdriel—which last year began turning out everything from simple taps to complex machine tools for SIAM di Tella Ltda. The machine section shown above contains 88 different large machines, serviced by overhead traveling cranes. The plant features excellent natural lighting, has an employees' cafeteria and bar, a garden, locker-rooms with showers.

PLACING small parts within reach of each operator is only one ingenious detail of a factory of Miniature Precision Bearings, Inc., which combines beauty, high-efficiency, and plans for expansion. Located in scenic New Hampshire, U. S. A., the one-story plant features a brightly colored entrance, good lighting, spotless work areas, orderly layout. The manufacturing area, connected by a long corridor to the office wing, can be quickly expanded in three directions.

Solids Go By Pipeline

ENGINEERS soon hope to be moving a large variety of solids by pipeline—chemicals, shale, ore, wood chips, even wheat. They say that they can pipe any solid that can be broken into bits or pieces and safely combined in a liquid medium. The 170-kilometer coal line in Ohio, U.S.A. (IMD, Nov'58, p32) has proved it can be done—the line now is operating at 40% more than its designed capacity, delivering 1,700,000 tons of coal a year.

Minerals and chemicals have been moved shorter distances by pipeline for several years. As railroad costs increase, more materials will be transported in this manner. Shipment by pipeline is technically possible for many products. Further development is only a matter of cost.

• **Recovery Costs**—Shipping a product by pipeline means suspending the material in a fluid that will not damage it. It also entails reclaiming the product at its destination from its slurry state without too great a cost.

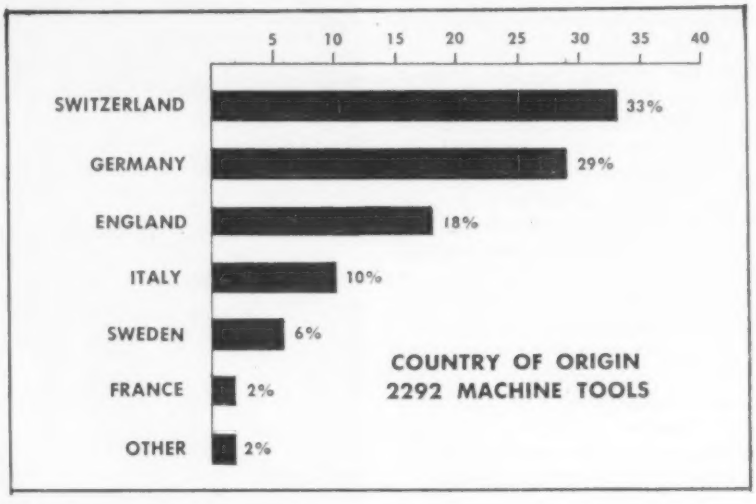
Large quantities of chemicals today are shipped by pipeline in the U.S.A. The longest solids line, aside from the Ohio coal system, is a 15-centimeter pipeline that moves gilsonite more than 110 kilometers from mines to the refinery for the American Gilsonite Co. The company turned to piping the material, used in making calcined coke and petroleum products, because no other transportation method was economical.

• **Piping Rock Mix** — Several large pipelines in the U.S.A. also are used for the transport of phosphate matrix, a mixture of phosphate rock and sand used in the making of fertilizer. The lines usually are short—extending only 8 or 9 kilometers—but the 20 lines in the U.S. move an estimated 40,000,000 tons of matrix a year.

All of these lines probably owe much to the pioneering work of the International Nickel Co., which in 1951 began piping slurries of nickel-copper concentrates and mill tailings from mines in Canada. The ore is moved only 12 to 16 kilometers, but goes in large volume—about 30,000 tons a day.

• **Grain and Wood** — Pipeline builders have far bigger plans for the future, the *New York Times* reported recently. On the design boards are projected lines for transporting wheat from Canadian growing areas to the Great Lakes. Also being studied is a project for moving nickel-cobalt crystals from a plant in Cuba to ships some distance away. The slurry would be carried across the Caribbean and pumped into a refinery in Louisiana.

Newsprint producers in Canada have plans for piping wood chips from forest sawmills to large pulping works. The economics of transporting such material in a water slurry has been proven in tests made by Canada's Pulp and Paper Research Institute. ●



Why U.S. Firms Buy Abroad

UNTIL RECENTLY, no reliable facts were available on how many and what kind of foreign machine tools are used in the U.S.A. To get this information, McGraw-Hill's *American Machinist* magazine sent out questionnaires to 5000 U.S. factories, asking these questions:

—Do you use foreign tools? What kind? Where were they made?

—Why did you buy abroad?

—Have you been satisfied with quality and service?

—Do you plan to buy foreign machine tools during the coming year?

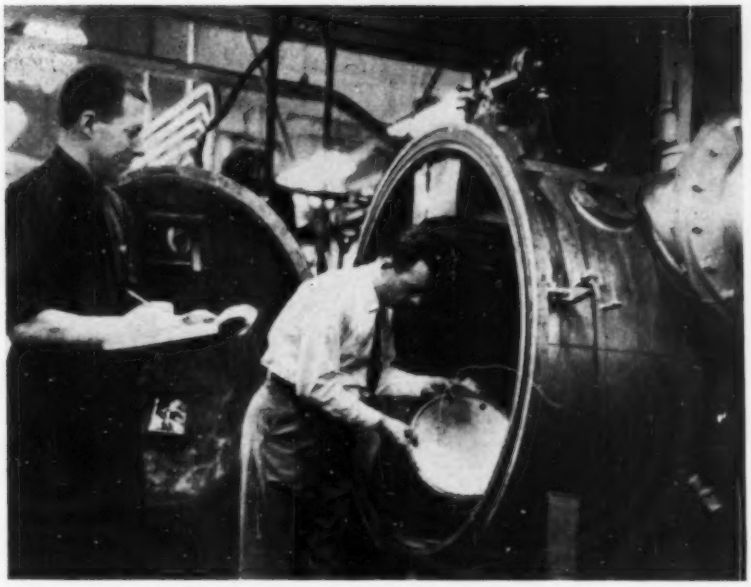
Answers came back from 2722 plants. Of these, 737 plants (or 27%) reported that they use one or more foreign machine tools. About 88% are used on production lines, and 12% for maintenance.

• **Countries of Origin**—Of the 2292 tools reported in use (chart), 98% were built in six European nations—Switzerland, Germany, England, Italy, Sweden, and France. The other 2% represents machines built in several countries, but mostly Belgium and Denmark.

The survey revealed that 60% of the machines were bought in the past 5 years, 85% since 1950, and some 12% were bought before the end of World War II. A much smaller portion (3%) were purchased during the post-war years (1946-49).

Of the companies reporting, 29% stated that they purchased foreign machines because the characteristics and capacity equaled that of U.S. machines, and they were priced lower. Most U.S. firms have been satisfied with the quality of foreign machines, as well as with service and parts availability.

• **Future Spending** — According to the survey, 1133 plants are planning to invest in machine tools in 1959, spending a total of $64,856,000 this year for both foreign and domestic machines. The remaining companies do not plan to buy or were undecided when they replied. About 4% of the machine tools purchased will be imports. ●



AUTO HUB CAP gets a coating of aluminum in NRC's metalizing chamber.

A Shield Against Corrosion

INDUSTRY has a new weapon in its fight against corrosion in a coating process recently announced by U. S. A.'s National Research Corp. The NRC process can put a heavy skin of aluminum—about 100 microns thick — on auto parts (photo), aircraft fittings, and consumer hardware.

The new technique is similar to the vacuum coating process now used for putting a decorative finish on paper, plastic toys, and mirrors. The aluminum is boiled in a vacuum, and the vapor condensed onto the part to be coated.

But the old techniques ended up with a coating only about .03 microns thick, of no value as a corrosion preventative. The thick coatings yielded by the NRC process offer good protection, and are nonporous and ductile. Researchers have used the process for successfully coating such diverse materials as high-tensile steel, cold-rolled steel, forgings, titanium, magnesium, and cast iron.

• **Applications** — Aircraft builders probably will be the first large-scale users of the new process, according to NRC spokesmen. Steel aircraft parts are subject to corrosion due to normal atmospheric attack, spilled fuels and grease, fog and sea spray.

In the past, aircraft parts often have been protected by aluminum dipping and electroplating. But both methods can have harmful effects on the properties of the underlying steel. Tests show that the new process yields a superior product for aircraft and missile use, a product that resists corrosion at the highest temperatures.

NRC executives figure that the largest user of their process eventually will be the automotive industry. Coatings could be applied to body sheet steel, forgings, and castings. And aluminum-coated steel might even replace chrome for bumpers and trim. A bumper coated by the new process was used during an entire winter with no observable damage.

• **Hardware Potential**—The new process is said to have a great potential in consumer hardware and architecture. The thickness of aluminum film on shaped parts, such as bolt and nut threads, can be controlled, and the parts can be anodized for abrasion resistance and decorative color effects.

NRC has developed its metalizing process to a point where it can be applied on a commercial scale, and is prepared to grant licenses for it. A subsidiary will design, manufacture, and install the specialized equipment required. (*Business Week, May* 23, *p*138)

Computer Directs Gasoline Making

FULL AUTOMATION of chemical plants and petroleum refineries has been on its way for more than five years. Now it is here. The Texas Co., U. S. A., has just put a 1,800-barrels-per-day catalytic polymerization plant under the direction of an especially-designed digital computer, developed for this purpose by Thompson-Ramo-Wooldridge Corp.

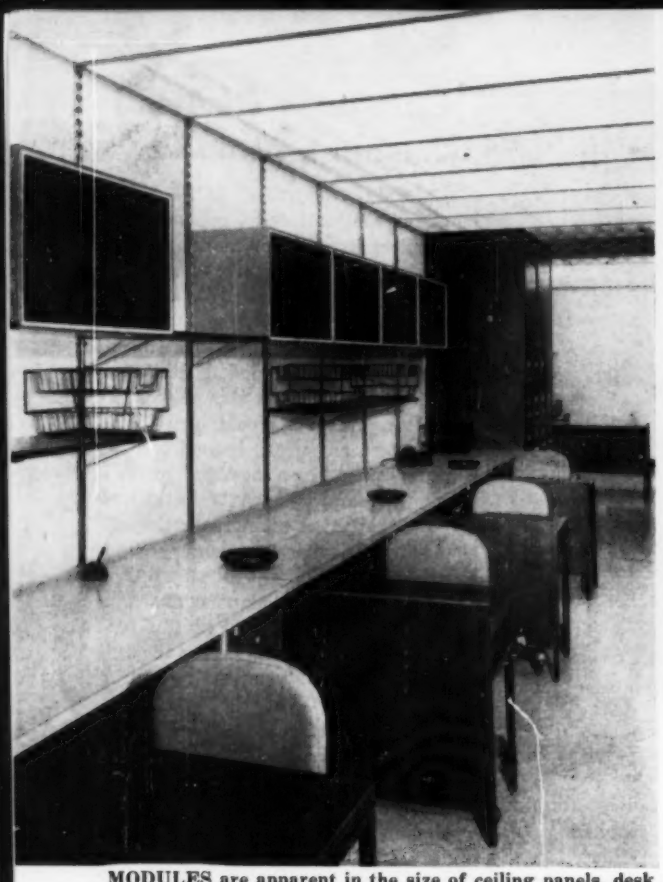
Texaco engineers turned to computer-control as a means of increasing process efficiency. With the new unit, they hope to increase the efficiency of converting refinery gases into high-octane gasoline by 6% to 10%. A normal plant converts a maximum of 85-87% of gas-feed into blending stock; the Texaco unit should end up by converting a minimum of 93% of the gases into liquid fuel.

• **How It Works**—The computer runs the plant by converting processing data into digital form, analyzing this data automatically, and dictating optimum operating conditions. The computer's 110 inputs receive such information as makeup of gases, pressures, temperatures, flow rates. The machine relates this data to input and output requirements, and monitors the condition and activity of the catalyst used in the reaction.

The computer evaluates all these factors, and makes a judgment for maximum operating efficiency in the light of its mathematical image of the plant it is controlling. Every five minutes it resets the plant's controls to conform with its judgment by adjusting a number of Bristol pneumatic recorder-controllers.

In addition, the computer checks the accuracy of its information. It watches its own performance, types out what it is doing (hourly or on demand) and sounds an alarm if any part of the system shows signs of impending danger or mechanical failure.

• **Catalyst Savings**—Texaco officials expect that the efficiency of their computer-controlled installation will mean reduced consumption of catalyst materials. Savings in this area are expected to amount to about $75,000 a year. (*Petroleum Week, April* 10, *p*38)



MODULES are apparent in the size of ceiling panels, desk sections, wall units. Layout is efficient for typists, flexible.

MODERN CONFERENCE ROOM gives progressive air, but many firms prefer traditional executive areas.

CONNECTING KITCHEN to serve conference room (right) is another trend in modern office design.

SALESMEN'S POOL, defined by luminous ceiling, emphasizes

Office Layout

THE MODULAR CONCEPT revolutionized office design a full decade and a half ago, but until recently, the revolution was practically confined to New York City, where office space is expensive enough to warrant the last word in efficiency.

Now businessmen everywhere are beginning to discover that, even where space is not at a premium, the principles of modular planning still apply. One reason is that modular furniture is being mass produced by more and more office equipment firms.

A module is an achitectural term, meaning a unit of space. A modular unit, therefore is simply something that occupies a given amount of space.

In terms of the office, the concept goes one step further: All the units used in the modular must be compatible—in other words, the large module units are multiples of the smaller ones.

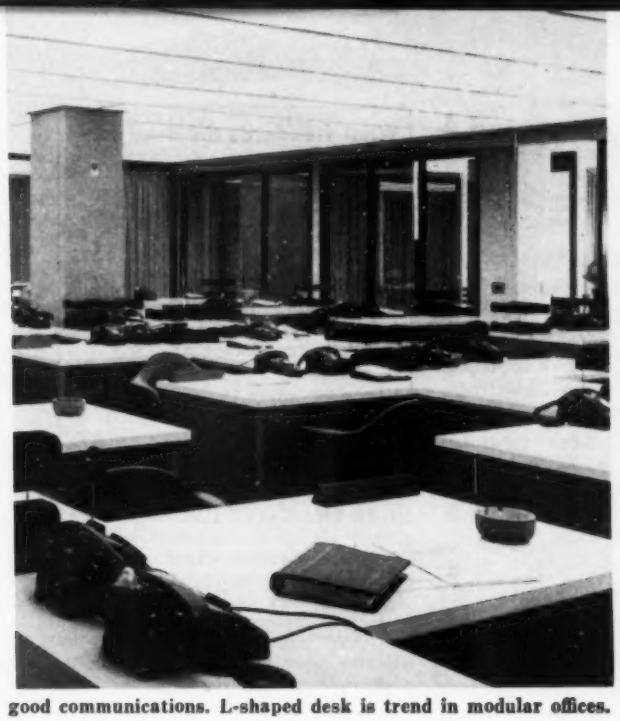
To be specific, desks might be 5-feet long, the wall partitions 2½-feet wide, and the filing cabinets 1¼-feet long. Thus, two filing cabinets fit neatly against a partition—anywhere in the office they are placed—and a desk fits neatly across two partitions, etc.

The result is a great deal of interchangeability and flexibility, as well as maximum use of space. The principle can clearly be seen in the pictures.

• **Internal Shells**—The modular concept was developed with the new office buildings that began being built after World War II. These buildings are essentially shells, with no unnecessary internal walls or fixtures. Each office area is then tailor-designed.

One of the pioneers in this work was the New York office planning firm, Designs For Business, Inc., which designed the offices shown here.

• **Floor Plan**—Ideally, the floor plan of a building



good communications. L-shaped desk is trend in modular offices.

SALES EXECUTIVE OFFICES surrounding the salesmen's pool are modular. Clear glass lets in light.

Goes Modular

should be designed to an absolute modular grid—so that a certain square module will divide evenly into the area. This makes possible a "pure" modular layout, with the possibility of perfect alignment.

In many cases, however, the modular planner discovers an impure grid. In some cases, he can make use of an oblong module. In other cases, it is possible to align every second, third, or fourth module.

Many older buildings, however, defy the module. But even here the office architects have an answer: They simply "pad" a strip of space and do not use it at all. They claim that the long-range benefits of the modular office outweigh the cost of the wasted space, especially if future expansion is planned.

• **Iconoclasts**—The modular planners have destroyed—or perhaps simply ignored—many of the cherished notions of office managers. Many companies today still believe that desk tops should be a dull gray or green, and the walls should be green, to cut down glare.

"Nonsense," say the modular planners. "Dull colors make dull people. And what most offices need is more light, not less glare." Thus the modern office is likely to have white desk tops, typewriters finished in primary colors.

The modular planners have also pioneered in furniture design. One of their most widely accepted ideas is the L-shaped working area. The working surface is greatly increased, with only a quarter turn of the body. And the L-shape allows a much greater variety of desk-drawer storage facilities.

Office equipment manufacturers now make modular desk tops and file units that can be put together in a variety of combinations to make L-shaped desks.

• **Work Areas**—The office layout specialist thinks in terms of "work stations" and "work centers." For each employee, he must be supplied with the answers to four questions:

Would partitions interrupt the flow of work?

Would distractions—sight or sound—influence it?

Is privacy needed?

What is the employee's status?

There are no hard and fast rules, however. It cannot be assumed that every man would prefer to have his own cubbyhole, as the salesmen's pool above illustrates. Partitions take up space and are expensive, but most important, they can seriously interfere with communications if misplaced.

The head-high cubicle partitions that are becoming so popular are designed to provide visual privacy. This is usually the prime need of employees on the level of junior staff specialists. In most companies, this will be the lowest grade of private working area.

Above this level, however, every company must decide how to make its executives' offices reflect their importance. In the U.S.A., it is common practice to establish five grades of private offices.

It should be noted that modular office layouts are not universally admired, especially on the executive level. Many companies have converted their working areas to modular layouts, but keep executive and customer areas richly traditional.

Some critics of the modular layout condemn it completely, saying it is efficient but antiseptic. The modular architect's answer is that modular principles should not be confused with interior decoration. While many modular offices are starkly modern, they are decorated that way by choice.●

How Work Measurement Is Used in U.S. Plants

THE MERITS of work measurement and incentive schemes are widely argued in plant operating circles. But there has been little information on how—and how widely—they are used.

To find out, McGraw-Hill's *Factory* magazine collected information from 785 U. S. plants.

How the plants use work measurement is outlined in the tables below. Next month, IMD will outline their use of wage incentives.

The basic survey finding: 60% (469) reported using work measurement. 51% reported incentive schemes for non-management employees. Size is also significant. Of the plants with from 100 to 250 employees, 47% use work measurement and 45% use wage incentives; of plants with 500 to 1,000 employees, 69% use work measurement, 63% use wage incentives.

For one reason, many of the small plants are process plants or job shops, where these management tools are not widely used. Also, it costs small plants proportionately more to use them.

Type of work measured

	% of Plants That Measure	% of Worked Hours Measured
DIRECT	99%	78%
INDIRECT		
Materials handling	33%	63%
Receiving & shipping	36%	71%
Tool & die service	11%	75%
Inspection	35%	72%
Housekeeping	14%	73%
Maintenance	13%	65%
Clerical, shop	5%	64%
Clerical, plant offices	4%	54%
Engineers	1%	3%
Plant protection	1%	3%

(302 plants)

DIRECT PRODUCTION LABOR is measured by all but one plant (a chemical plant) reporting on this point. But few plants say they measure indirect labor. And as the second column shows, much of the working time of all types of employees is left unmeasured. This hurts work-measurement effectiveness, especially if there is an incentive plan.

On a related question, the plants indicated that the Number 1 problem in work measurement is a better way to measure nonrepetitive work. However, of the plants that do measure indirect work (165), about half said they use direct standards. Most of the others relate performance to the production operations they serve. Several are applying work sampling.

Note: Tool and die service is not a common function to all the plants. It is measured by 30% of the metalworking plants, against 11% of all.

How standards are set

	Techniques Used by % of Plants	% of Standards Set by
Time study	87%	56%
Standard data (Methods Time Measurement, Work Factors, etc.)	72%	42%
Predetermined time standards (MTM, Work Factors, etc.)	29%	32%
Historical data	29%	21%
Estimate based on experience	32%	20%

(302 plants)

PREDETERMINED TIME standards have gained since *Factory* surveyed their use five years ago. Though the number of plants that set standards this way—as opposed to checking standards—is still low, *Factory* notes that confidence in the predetermined system seems to be improving, and the magazine predicts that their use will "double in under five years."

On the other hand, only 72% of the responding plants set standards with standard data. And these plants set less than half (42%) of their standards in this way. This is surprising, since work measurement specialists have long said that this is the ideal way to set standards.

There is still a significant use of past records and estimates—mostly confined to plants using work measurement without having wage incentives. The percentage of standards set this way is small, and *Factory* believes it is getting smaller.

What standards are used for

	% of Plants Using
Control of labor performance	90%
Estimating product costs	89%
Cost standards for budgetary control	73%
Scheduling production or jobs	72%
Wage incentives	67%
Establishing product prices	67%
Other	8%

(301 plants)

MORE THAN ONE USE is typical of all the plants—the average uses per plant are between four and five. Surprisingly, however, 10% of the plants say they do not use standards to control labor performance.

"Other" uses include such uses as machine replacement calculations, manpower and job scheduling, and plant layout planning.

How often they are reviewed

interval in months							
3	6	9	12	18	24	36	60
11%	14%	3%	47%	3%	7%		3%

% of plants (149 plants)

AUDITING of applications is done surprisingly little, considering that without occasional on-the-spot checks a work measurement application can develop flaws that might not be detected otherwise.

Controlling the standards

change allowed	% of plants
under 5%	31%
5 to 15%	63%
15 to 25%	3%
25 to 35%	2%
over 35%	0.5%

(255 plants)

POLICING STANDARDS is also surprisingly loose. Loose standards may be all right where work measurement is used as a control, but not where used in connection with an incentive program.

When standards are changed

changed completely	31%
changed in part	76%
do either	7%

CHANGING ONLY that part of the standard that needs it is becoming common practice—and is almost universal in plants with incentives. Time values for each job element are a big help in changing only affected part.

Problems Facing Latin America

"THE PROFESSIONAL MANAGER is replacing the autocratic, all-function patron in Latin American industry," proclaims the Spanish-language magazine *Ingenieria Internacional Industria*, in its 40th Anniversary issue — dedicated to these new leaders and the problems they will face over the next decade.

Overriding all other obstacles to Latin American industrial progress, *Industria* observes, is the need to identify and control costs. This is a basic factor, and inherent to all of management's problems.

But there is also an overriding reason for optimism: The new, modern factories being built are forcing the managers of older plants to reform their operations, and to rely more heavily on scientific managerial skills.

The efficient use of plants and equipment, and low-cost mass production, will eventually come about in Latin America. But the change will be gradual, with many sectors of industry lagging behind. The general trend seems to be to use older equipment to sustain growth, new machinery to expand—and this trend will probably continue over the next decade.

• **Revised Attitudes**—Before the best use can be made of older equipment, however, the attitudes of many managers in Latin America will have to change. The maintenance function has traditionally been neglected—strangely enough, primarily because of the equipment shortage. Pressed to get out maximum production, management gambles that machinery will not break down; and the gamble is won often enough to sustain the practice. In the long-run, of course, the machinery does break down—seriously—and few managers bother to calculate the real cost of neglecting maintenance.

One reason for the complacent attitude of many managers is the "seller's market" that has characterized much of Latin America in recent years — production goals have been whatever could be produced (as one result, far too much capital is usually tied up in inventories). This condition will change, not only from increased competition, but from consumer demands for better quality.

Over the next decade, more and more cost accounting systems will be installed. Production planning and control systems will become commonplace: "No plant is too small to ignore production planning and control," *Industria* points out. Quality control, long neglected, will become a normal part of plant operations. And there will be far more standardization of products and parts—it is now common for companies to make too many sizes, types, and models of its products.

• **Labor Relations** — Management's attitude toward labor will continue to change over the next decade. There is more interest in human relations than ever before, and an increasing understanding of labor's contribution to plant operations.

The climate of collective bargaining will surely improve, side by side with gains in the democratic process. Trade unionism is hampered by Communist elements, *Industria* observes, but the free trade unions are trying to work out solutions to labor disputes through collective bargaining, rather than government decree. Labor laws badly need revising all over Latin America.

Trade unionism will become more responsible as more trade-union leaders become educated in industrial economics and bargaining techniques. But even competent leaders have had great difficulty in getting across the idea of productivity—and the relationship between work done and money earned—to trade-union members. Progress will be slow, but there will be steady advancements in labor relations.

• **Supervisors**—Plant leadership is also a problem—there are just not enough good supervisors to go around. And competition for the good ones makes them hard to keep.

Communications will receive more and more attention. Many supervisors tend to communicate in only one direction, up to higher management, or down to the workers. Both channels are needed, and much progress will undoubtedly be made in the next decade.

• **Safety** — Many managers in Latin America still believe that a safety program interferes with production goals, and that productivity and safety are separate problems. But great strides in accident prevention are being made, especially in Chile, Uruguay, Mexico, Brazil, and Argentina, where safety councils are active.

What is needed is a set of industrial safety standards, developed by an Inter-American organization. This will be the objective of national safety councils over the next decade.

• **Marketing** — Latin American managers have much to learn about promotion, pricing, distribution channels, and sales policies. The next decade will see much greater emphasis on the neglected art of marketing. ●

Useful Guides for Training Managers

THE BASIC CONCEPTS of management development listed below are based on a research study of the management training program used by the U.S.A.'s General Electric Co. The list is offered by a consultant to the program, Moorhead Wright, as "useful guides, not eternal verities":

—Avoid standardization. The development process is a highly individual matter.

—A man's development in business is self-development.

—Specific personality characteristics should not be considered as prerequisites to management positions.

—A man's development results 90% from day-to-day experiences, 10% from education, company courses, rotation, etc.

—Development opportunity must not discriminate between "promising" and "unpromising" men.

—Primary emphasis should be placed on development in the present assignment, rather than on the promotional ladder.

—Managing is a separate and distinct kind of work, a profession.

—Decentralization of decision-making is a prime instrument of development.

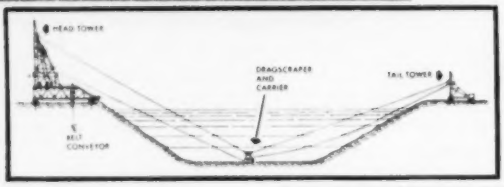
—Line managers at all levels are responsible for development of their subordinates.

—Moral and spiritual values are basic in the development process. (*Chemical Week, March* 21, *p* 124)

Tough Digging, Long Hauls... Routine Jobs for Sauerman DragScrapers

240-Ft. Bank... 350-Ft. Haul

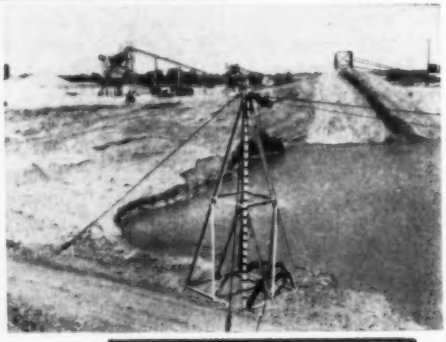
This mobile Sauerman Tower Excavator digs 480 yds. per hr. on an average haul of 350 ft. from a high bank to a portable field hopper. The 12-yd. Crescent DragScraper operates between steel head and tail towers. The towers are mounted on two sets of railroad tracks and ride on four sets of trucks. DragScraper power is supplied by two hoists mounted on the head tower. One hoist operates the load and pullback cables, the other is used to tension the track cable. The hoists are controlled by one operator located in the cab on the tower. The load cable handles over 400,000 tons of material before replacement.



Drawing shows typical mobile tower excavator digging in wet pit.

75 Ft. Under Water... 800-Ft. Span

A 5-yd. rapid-shifting DragScraper supplies about 200 yds. per hr. to the plant hopper in background. Bridle tower in foreground is one of two supporting the bridle shifting cable which is controlled by the third drum of the Sauerman hoist. Lateral shifting of the DragScraper's line of operation is readily accomplished by power-shifting the trolley and tail block to a new position on the bridle cable. The DragScraper is digging 75 ft. under water and the operating span is 800 ft. from head frame to the bridle towers. Over a million tons have been excavated from this pit. The DragScraper often operates 24 hrs. a day to handle contract demands.



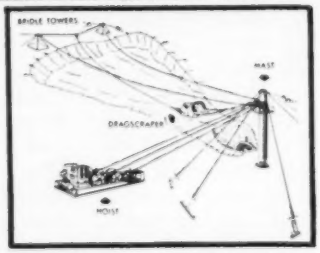


Diagram shows details of Sauerman rapid-shifting DragScraper.

Sauerman machines dig and haul in one continuous operation . . . work on high bank, dry pit or under water . . . handle most bulk materials. Consult Sauerman engineers about your job. We will promptly supply appropriate literature.

SAUERMAN BROS., INC. 644 SO. 28th AVE. BELLWOOD, ILL.
Linden 4-4892 • Cable CABEX—Bellwood, Illinois

Crescent Scrapers • Slackline and Toutline Cableways • Durolite Blocks

● MARKETING

This Small

With no outside help, Cullom & Ghertner turned its sales department into a marketing organization.

LAST JANUARY, three C&G men dropped their old titles and their old way of thinking to take on new responsibilities, one of which is membership on their company's new marketing committee.

The change resulted from a major reorganization at Cullom & Ghertner Co., a small U. S. firm with big ideas. But perhaps most amazing is the fact that the reorganization went into effect less than three months after it was approved by the executive committee.

The idea for the reorganization came from Edward Hundley, the company's energetic 35-year-old former sales manager and now vice president, marketing. Hundley's plans evolved out of his awareness of his company's problems, and a study—through articles in business magazines—of how large companies have been reorganizing their marketing organizations.

Actually, though Cullom & Ghertner is fairly small by most industrial standards, it is large for its own industry, the printing industry, which is made up mostly of small, fiercely competitive firms. Cullom & Ghertner describes itself, in fact, as "the Southern U.S.A.'s largest general business forms printer." The company has had a fourfold increase in sales since World War II. About 85% of its $3-million in sales last year came from billing forms, inventory blanks, carbon-copy checks, and the like; the balance came from color lithography produced for direct mail users.

I. Marketing Problems

Hundley knew that customer turnover—always a problem for printers—was increasing as small shops turned more and more to specialty printing. He also worried that the company's future growth

Company Thinks Big

—and development of new products and processes—would take more planning and organization than was possible under the old organization.

Under the old set-up, emphasis was on field sales effort, with sales management divided geographically. The company has two plants, at its Nashville, Tennessee, headquarters and in Atlanta, Georgia, and seven sales offices east of the Mississippi River. The biggest is in New York, where C&G vies for the business of the large corporations with headquarters there.

The company goes after three kinds of business. One is contract printing, almost all of which comes from the New York office; another is the "house account" business with no sales commission involved; and the other is the direct sale of printed forms.

Before the change, Hundley shared supervision of the sales force with his assistant, and even though sales manager, he also did a lot of personal selling. At odd moments he tried to find time to attend to his other duties: advertising, promotion, and public relations.

Hundley's reorganization called for decentralization of management and greater emphasis on sales-support activities. He proposed to add marketing research, to reorganize sales lines and to base all marketing effort on stronger incentive, more thorough planning and record-keeping, and intensive research for new markets and new products.

At a two-day session with the executive committee of the company, held at a quiet lodge away from the office, Hundley pointed out that the company already had the men needed for the reorganization, and the extra cost would be relatively little. The executive committee voted a unanimous "yes."

II. New Set-Up

Marketing research was assigned to a reorganized advertising department, whose responsibilities would also include promotional and public relations activities. The sales vice president—Hundley—became marketing vice president, with more management and less in-the-field responsibilities.

Sales management was divided into three units:

Since New York accounted for almost all contract sales, this division was given responsibility for processing all contract sales (even those originating elsewhere) in addition to regular sales responsibility for New York. An assistant was authorized for the New York manager, to free him from many order-handling and customer-service details.

House - account responsibility, previously divided between Hundley, his assistant, and the New York manager, was centered in a national house-accounts manager. And direct sales management, also loosely divided under the old set-up, would be concentrated in a national sales manager responsible for the district offices outside of New York.

• **Marketing Committee**—Previously, Hundley had handled all sales responsibilities and made decisions on his own. Without enough time to think, without benefit of contributions from others, it was only natural that his decisions—by his own judgment—fell short of perfect. The marketing committee, composed of Hundley, the advertising manager, and the national house-accounts manager, is designed to bring more minds to bear on marketing problems, and to improve decision making.

Another improvement approved by the committee was electronic tabulation equipment for keeping a running account of sales inquiries and sales, to speed analysis and planning.

Perhaps most important, job specifications were drawn up, clearly spelling out each individual's responsibility and authority.

III. Early Returns

The executive committee approved the plan last November. Less than three months later, on January 1 of this year, the new organiza-

profitable plastics molding

WITH STOKES AUTOMATIC PRESSES

American Insulator Corp., New Freedom, Pa., uses a bank of Stokes Model 741 fully automatic compression molding presses to produce parts, ranging from bottle caps to electrical parts in a high-speed—'round the clock operation.

Customers throughout the world profit from Stokes' unparalleled experience as designers and builders of process-engineered machinery and equipment . . . including plastic molding and powder metal presses; vacuum—metallizers, furnaces, dryers, systems, and pumps; chemical process equipment; and pharmaceutical tabletting machines and accessories.

Stokes also offers extensive research laboratory and customer advisory facilities. Your inquiry is invited.

International Division
F. J. STOKES CORPORATION
5500 Tabor Road
Philadelphia 20, Pa.

STOKES

tion formally went into force. During that period, Hundley—with the strong support of top management—had won the cooperation of everyone, by explaining, persuading, demonstrating.

It is too early, of course, to expect substantial results from the reorganization as yet. But Hundley notes some important changes:

—Salesmen now work on commission, with a guaranteed drawing account. The emphasis has been changed from costs per call to the salesman's earnings per call.

—New product emphasis has been focussed internally at first, on new equipment and techniques. But more and more, it will lead to better products and services.

—The marketing committee has made definite contributions. One example was suggestions to improve a direct-mail advertising campaign, proposed by the national sales manager. Under the old setup, the original plan would have had only perfunctory discussion.

—Marketing research has already begun to be useful.

—Morale, good before, is even better as a result of new horizons opened by the new organization.

"We were limited and inflexible," sums up Hundley. "Now the sky is the limit. The new organization has stimulated new thinking up and down the line and opened a world of new opportunities." (*Printers' Ink, Feb* 22, *p* 69)

Two Types of Customers

That is why the Heath Co. charges its dealers the same price as its mail-order customers.

DEALER DISPLAY RACKS are opening up a "second sales front" for the U.S.A.'s Heath Co., manufacturer of electronic products in "do-it-yourself" kit form—high fidelity sound equipment, amateur radio gear, testing instruments, etc.—which until recently were sold only by mail, direct from the plant in Benton Harbor, Michigan.

Strangely, however, retail dealers pay the same price for the "Heathkits" as Heath's mail-order customers. Dealer prices average 14% to 20% above mail-order catalog prices, but freight savings on quantity shipments add to the dealer's profit.

As precedent for this system, Heath points to the merchandising success of the U. S. A.'s Sears Roebuck and Montgomery Ward, both mail-order houses that expanded into premium retail sales. The difference is that these companies operate their own retail outlets, whereas Heath is selling through dealerships.

• **New Customers**—Can dealers compete at such a price disadvantage? The answer seems to be "Yes". And the reason is that dealers sell to people who are reluctant to buy through the mail, others who will pay extra for immediate delivery, and still others who may have been missed by Heath's mail order promotions.

As an added attraction, Heath expects its catalog customers to go to the dealers for service, and that means potential customers for other Heathkits and related products. The dealers can also sell the fully assembled kits for customers with too many thumbs.

• **Turning Points**—Heath's present prosperity is a far cry from the dark days after World War II when the Heath Aviation Co., its electronics business dried up, and its employee group shrunk from 200 to 26, was reduced to selling war-surplus equipment.

Its first electronic kit (an oscilloscope) was made up mostly of war-surplus components—and that enabled Heath to sell it 50% below competitive products. From that start, Heath began adding kits until it had a total of 35 in 1955, all sold by mail.

In 1955, Heath became an autonomous division of the Daystrom Co., an electronics producer that saw a growing outlet for its components—though Heath today is still free to buy where it gets the best market price. Another advantage of being under a larger corporate wing: Last year, Heath borrowed the money for a new plant from its parent (the loan has since been repaid in full).

Since Daystrom took over, Heath's employees have increased from 150 to 520, its Heathkits from 35 to 135, ranging from $15 to $300. Many of the additions have been in the higher-price brackets—an electronic organ is the latest addition—and Heath is now actively exploring the market for office equipment in kit form.

• **Dealer Relations** — Heathkit dealers are being carefully selected. Heath expects price protection, excellent service facilities, and no high-pressure sales tactics. It gives large, exclusive territories in return.

Heath will share promotional costs 50-50 with its dealers. The company contributes on a sliding scale, from 1% on orders between $200 and $1,000, and up to 3% on more than $5,000. The average order calls for a 2½% contribution.

The dealer can use this money for buying literature, sales training material, and display racks. Heath will also share the cost of local advertising. And the company also sends its dealers a monthly newsletter.

• **Time Table**—At present, Heath has 28 dealers with 119 outlets, and it is adding about 10 dealers a month. Its plans call for 300 dealers in the top 200 U. S. markets, representing 80% of Heath's potential market. Attention to smaller markets will come later.

Heath has on hand 2,200 applications from potential dealers, and a Heath representative will investigate each applicant. He takes no orders—they go straight to the factory—but he will help the dealer estimate inventory requirements. Heath recommends a two-week stock, which means a high inventory turnover.

• **More Catalog Sales**—Heath by no means intends to neglect the mail-order side of its business. One advantage of mail-order business is the opportunity for detailed sales analysis, and Heath knows more than most companies about its over 500,000 customers.

"For several years," says President Daniel P. Knowland Jr., "about 50% of our orders have come from new customers. About 52% of these new customers first hear of Heathkits from old customers, 28% from our magazine advertising, and 20% from direct

mail literature." The biggest customer groups are engineers and technical students.

Heath is currently spending about $150-million a year for advertising and promotion, and it mails an average of over 100,000 direct-mail pieces every week. The company has even worked out a successful installment purchase plan for its mail-order customers.

• **No Conflict**—Knowland expects no conflict from this dual sales approach. "Thus far we have not found many who look at our kits in stores and then buy direct from the factory by mail," he explains. "We are developing two distinct types of prospects." (*Sales Management, May* 15, *p*71)

Consumer Contests Are Gaining Favor

CONSUMER CONTESTS—for cash and merchandise—are booming in the U. S. The pampered buyer merely has to think up a name for a bull to win a new house, or do a child's puzzle to win seven times his weight in silver dollars. For one "contest"—the word is almost a misnomer today—you just have to send in your name and address to "compete" for a '59 model Pontiac.

By the year's end, current contest campaigns will have cost an estimated $60-million for prizes and promotional budgets to entice a public that is eager to get something for nothing. Even the more conservative companies are trying their hand at the game.

What's behind the popularity? Television quiz programs have helped, by proving that people are

. . . it's VIKING PUMPS exclusively at Tousey Varnish Company's New Plant

When Tousey Varnish Company of Chicago built a new 1,000,000-gallon capacity paint and enamel plant at East Moline, Illinois, they installed twenty-five Viking Pumps. It is one of the most modern plants in the nation, and is entirely Viking Pump equipped, including 10, 18, 35, 50, 90 and 200 GPM sizes. When solvents, resins and varnish arrive at the plant in tank cars and transports, Viking Pumps unload them. Within the plant Viking Pumps transfer liquids and pastes, and are used with filtering equipment. Finally, Viking Pumps load finished products for delivery. D. A. Rhode, Manager of Manufacturing, states that the Viking Pumps are operating perfectly and he appreciates their reliability.

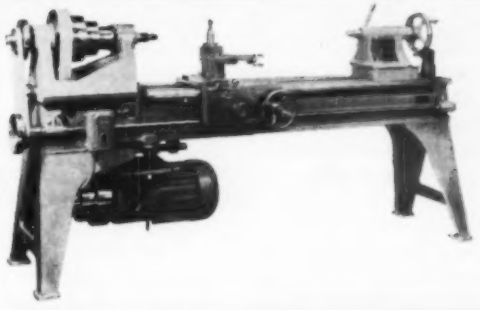
If you have a complete, new plant to equip or just one pumping problem to solve, learn what Viking positive displacement pumps can do for you.

Write today for bulletin Section 595.

VIKING PUMP COMPANY
Cedar Falls, Iowa, U.S.A. In Canada, it's "*ROTO-KING*" pumps
WORLD WIDE SALES AND SERVICE

16 Spindle Speeds

The **"OLIVER"** No. 20
PATTERN MAKERS' LATHE



Features Lima drive unit — with single-speed motor and 4-speed transmission, to provide 16 spindle speeds! Power feed carriage optional, extra. The "Oliver" No. 20, in four sizes, can be used for turning light nonferrous metals or, in modified design, for metal spinning work. Send for folder. "Oliver" Pattern Makers' Lathes are famous the world around!

OLIVER MACHINERY COMPANY
GRAND RAPIDS 2, MICHIGAN

excited by the lure of really important money and prizes. And with the business recession over and people in the mood to buy, companies feel this is the time to attract the consumer with special retail promotions.

• **Consultants**—Experts who promote the ideas of contests find that companies are becoming more and more receptive. One consultant, Stanley Arnold, recently sold the usually conservative du Pont company on the idea of a U.S.A.-wide contest—something that up to now the company had felt was below the dignity of its corporate image.

Du Pont's 90-day million-dollar contest was aimed at stimulating sales of its "No. 7" line of automotive polishes and waxes, an old and best-selling group of items. Significantly, the campaign was timed for the peak of the auto-driving season (Arnold insists companies should avoid using contests during off seasons: "I'd rather get a 10% increase on $1-million in sales than 10% on $100,000.").

• **Nothing To Buy** — In many ways du Pont's contest was typical of the present stage of the art. There was nothing to buy, but a contestant got a bonus if his entry coupon (available at service stations and hardware stores) carried with it a sales slip for one of the No. 7 products.

The contest itself was extremely simple. Its theme was the figure 7. Entrants had to count the number of 7's they could spot in a panel (picture, preceding page). First prize was seven times the winner's weight in silver dollars—for a 170-pound man this would come to $20,230. Then came 7 Buicks as second prizes, 77 portable television sets as third prizes, and 777 transistor radios as fourth prizes.

Carrying the product image—in this case No. 7—in the promotional advertising is a trick that good contests use wherever possible. For instance, first prize in a recent mattress manufacturer's competition was a mattress stuffed with money.

• **Tailored to Audience**—Another essential ingredient is for the contest to fit the level of the audience. That means relative simplicity for mass-consumption markets, relative sophistication for sophisticated markets.

• **Attention Getters**—Do contests pay off? Arnold has no doubt about it. But he emphasizes that widespread promotional efforts are necessary. "All contests are for is to get attention," he says. And once they have succeeded in that task, sales increases are almost sure to follow. (*Business Week, May* 16, *p*53)

Scientists Unveil Product's Talents

COMPANIES often fail to achieve maximum output because they do not consider all possible uses for their product.

Take the case of Microbeads, Inc., a U. S. manufacturer of small glass beads. Until recently, 75% of its output went into one operation, the highly seasonal one of highway markings and signs. Clearly, if the company could discover a wider range of applications, demand would be steadier and production greatly increased.

• **Wealth of Ideas**—To discover their product's latent talents, Microbeads decided to hold a contest. Organized nationwide, it brought in over a thousand ideas. Now it is likely that the new uses will outstrip the old.

Only industrial scientists were eligible for the contest. Entries were judged on the basis of how many new jobs they would create in the company during the next five years, and prizes were offered. In spite of fears that scientists would be too sophisticated to enter, the contest produced nearly 1,500 ideas from 750 technical men.

The winning entry suggested that the beads—tiny glass spheres, some as small as .00001 cm. in diameter, that come in 25 graded sizes—could be used to improve welding electrode coating. Alternatively, according to other contestants, they might act as a non-vaporizing lubricant for space ships, or even as a starch for linen altar cloths.

• **Many Industries**—The replies indicated that, far from being restricted to one application, microbeads could find a place in a wide variety of industries. For example, they would give excellent acoustical resistance, since the space between the beads provides a multiplicity of narrow passages. In metalworking, beads used in molding and core sands would eliminate defects that occur when the sands expand during the casting of steel. They would be superior to powdered glass, wood flour, and other powdered materials that reduce the permeability of molding sand. Other important uses could be found in plastics (to reflect heat in plastic windowpanes), in the petroleum industry (for catalyst beds in refiners), even in printing plants (for replacing lead type in conjunction with a plastic material). *Purchasing Week, May* 4, *p*22)

In Marketing

COMMERCIAL TELEVISION is now available in 32 countries, with an audience of 240-million, according to a new television directory just published by Intam Ltd., a London firm that specializes in measuring the size of television audiences. Within 10 years, the audience for commercial television is expected to reach close to 360-million.

Cost varies widely. The price for a half-minute at peak hours, reaching 300,000 sets, varies from as little as $60 to as much as $1600. The time and money spent on commercials is in direct proportion to cost of the time: the more expensive the time, the more effort goes into making the commercial effective.

PERFECT PROMOTION was recently demonstrated by the Amstel beer concern in the Netherlands. A pottery beer mug was offered in return for three Amstel beer labels, plus a small charge of about 20¢. Within a month the entire Netherlands pottery industry could not meet the demand.

The final count showed that 1-million mugs had been shipped —and that meant 3-million bottles of beer had been consumed.

Amstel hired a direct-mail firm to handle the mailings, including a letter apologizing for the delay, and the whole campaign paid for itself from the small remittance included with the labels.

Perhaps you, too, can profit from

Air Products
...INCORPORATED

CAPACITY

... capacity to design, produce, install and operate *complete systems* for separation, purification and liquefaction of gases – systems that provide profitable advantages and opportunities throughout industry.

Liquefied gases from Air Products equipment supply all major U.S. missiles.

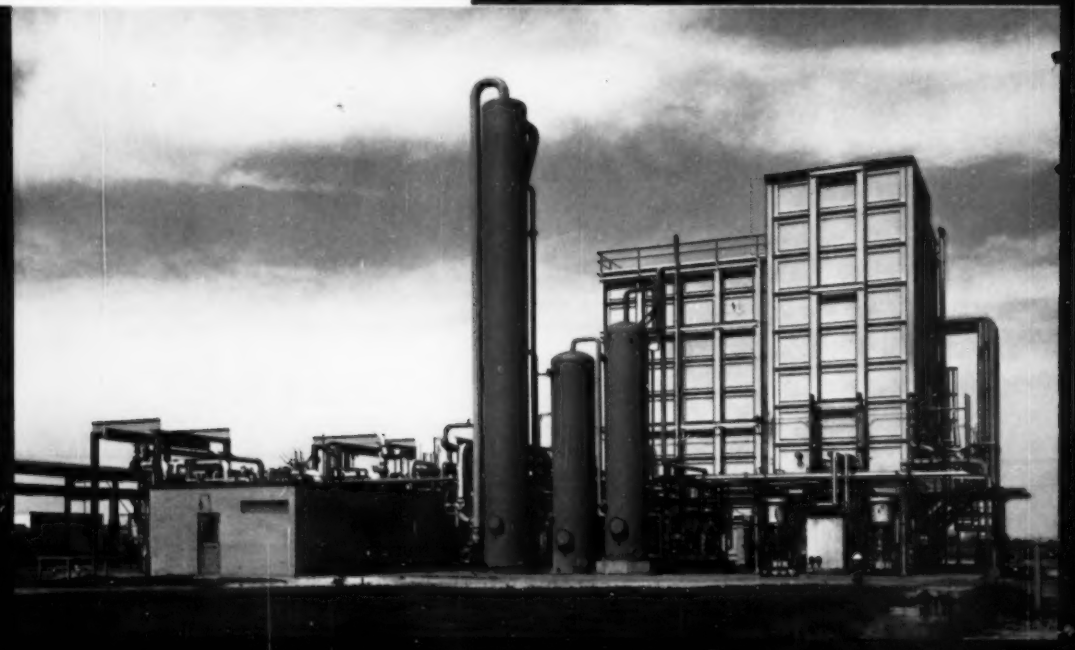
HOW THE MILITARY SERVICES use Air Products CAPACITY

Large-scale low-temperature systems, ultra pure gases and liquids, and a broad range of specialized cryogenic "hardware" are supplied by Air Products to the military. When large quantities of liquefied gases were needed for rocket engine development and missile testing, Air Products quickly designed, manufactured and put on stream complete production facilities. Typical facilities paid for themselves in less than a year's time. Air Products also provides a broad line of portable air separators for field and shipboard use . . . and has advanced the development of exotic fuels. And, Air Products produces advanced design liquefied-gas pumps, cryogenic storage and transfer systems, electronic cooling devices and refrigeration and distillation equipment for military uses.

YOU will find here tangible evidence of a growing technology. Applying "Cryogenics" (the science of low temperatures) and engineering broad new routes to low-cost, high-purity industrial gases is the main business of Air Products.

Air Products combines original research knowledge with engineering and manufacturing capabilities and substantial operating experience. These integrated activities have

These companies and many others are the beneficiaries of major facilities provided by Air Products:
Acme Steel • Bethlehem Steel • Brazilian National Steel • Celanese • Dow Chemical • du Pont • Grace Chemical • Great Lakes Steel



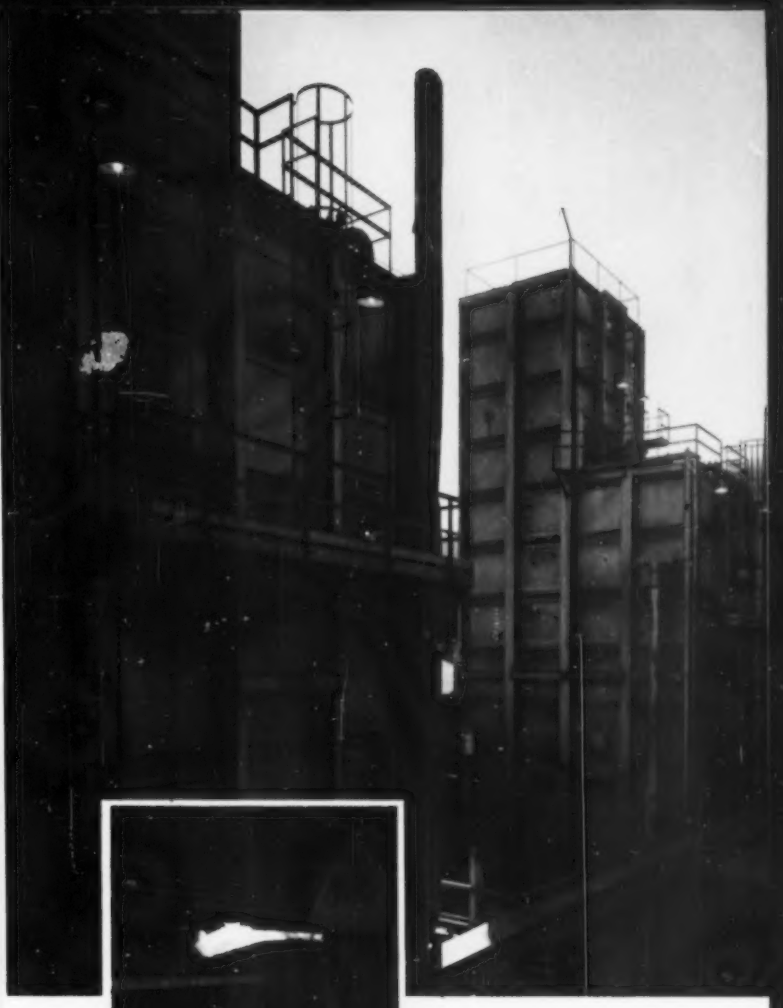
Petrochemical plants use Air Products equipment in feedstock preparation and product purification.

HOW THE STEEL INDUSTRY
uses Air Products CAPACITY

In the blast furnace, the open hearth and the new converter processes — Air Products oxygen efficiently increases steel mill capacity. Annealing nitrogen and other gases are also provided on a low-cost tonnage basis.

Air Products' complete gas supply systems are installed at steel mills without capital investment or operating worries on the part of the users. Continuity and reliability of supply are assured. On-site facilities pioneered by Air Products reduced the cost of oxygen 80% in 12 years — transforming oxygen from a costly chemical to a practical working utility.

Further progress marks on-the-job development work now continuing around the clock at major steelmaking facilities. Entirely new metallurgical techniques . . . and new profits . . . are available through Air Products.



Air Products pipeline oxygen serves the Basic Oxygen Furnace Process.

helped provide many Air Products customers with distinct competitive advantages.

Air Products is the world's leader in APPLIED CRYOGENICS — the practical and profitable use of low-temperature science for industry.

Perhaps this CAPACITY can help solve your problems — in cryogenics, in industrial gas supply systems, or in some new area where "ground rules" are yet to be established.

• Jones & Laughlin Steel • Osaka Oxygen • Spencer Chemical • Sun Oil • U.S. Government - All major research and defense agencies • United States Steel • Venezuelan Ministry of Mines • Weirton Steel

HOW THE CHEMICAL INDUSTRY
uses Air Products CAPACITY

Air Products low-temperature systems permit many modern chemical plants to improve operating efficiency and end-product quality — and to develop new processes and products. This results from the ready availability of low-cost tonnage quantities of oxygen, nitrogen, hydrogen, ammonia and methanol syn-gas, carbon monoxide and hydrocarbons such as purified methane, acetylene and ethylene. Low-temperature separations of gaseous mixtures now make it practical to recover valuable components from natural gas, refinery off-gases, coke-oven gas and other "waste" gases. The versatility of cryogenics—as applied by Air Products—works profitably for the chemical industry today . . . offers unparalleled future opportunity in this fast-growing industry.

HIGH PURITY GASES AND LIQUIDS —available like any other utility with the help of Air Products CAPACITY

. . . The supply is dependable . . . the price guaranteed . . . with Air Products on the job.

Air Products ...INCORPORATED

Perhaps you, too, can profit from

Air Products

CAPACITY*

- To find the new opportunities Applied Cryogenics may offer in the manufacture, separation and purification of Industrial Gases.
- To provide integrated research, engineering, manufacture and operation . . . complete services under a single responsibility.
- To forecast accurately and guarantee total cost, superior performance and reliability.
- To put entire gas supply complexes to work for you *without capital investment on your part.*

Air Products CAPACITY has helped our customers to step out ahead of competition in familiar fields . . . to open up entirely new areas of opportunity through new products or processes. A letter or telephone call will put Air Products CAPACITY to work for you.

Information is available on:

superconductivity
frozen free radicals
biological preservation
environmental control
low temperature
catalytic reactions
infrared detection
masers

purification and liquefaction of:

argon
carbon monoxide
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hydrogen
krypton
methane
neon
nitrogen
nitrogen trifluoride
oxygen
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Air Products
INCORPORATED
ALLENTOWN, PENNSYLVANIA

Air Products (Great Britain) Ltd., London
Air Products, S. A., Caracas
Dynamic Research, Inc., Los Angeles

How a Continuous Process Plant Set Up a Standard Cost System

And with realistic standards established, supervisors are held responsible for cost control.

BEHIND management's decision to install a standard cost system were these facts:

The company had been using average "year-to-date" figures to judge plant (a continuous process) performance, and it recognized that the to-date figures contained abnormalities and were inadequate. Production reports emphasized manufacturing data, with no attention to relative cost factors. A separate cost sheet was issued, but it was complicated, usually out of date when issued, and seldom used by the supervisors.

Top executives of the company hoped—and believed—that a standard cost system with realistic, attainable standards, a minimum of detail, and participation by the supervisors, would lead to increased cost consciousness and cost control.

• **Cost Analysis**—The key to the system that was worked out is a monthly cost analysis report, which compares actual costs to standard costs and pinpoints the differences. At a monthly cost meeting, the supervisors discuss the month's record and make plans to correct weaknesses.

The system can be easily adapted by any plant with a continuous process, such as chemicals, pharmaceuticals, foundries, food, cement and lime, paint, rubber, etc.

The actual operation in question is a chemical process: a three-shift, seven-day operation that turns out a crystalline product from a combination of liquid ingredients, mixed by formula.

I. First Decisions

Fortunately, there were several reasons why the system could be made simple and effective. It was apparent that cost control should concentrate on raw materials: The ingredients accounted for about 65% of manufacturing costs, which ran to over $1-million a month.

In addition, the labor force was more or less fixed, and there was little variance in overhead charges. Thus, there were none of the complications that can play havoc with a standard cost system.

It was decided to base the standard costs on the best consecutive three or four months' experience during the prior three years, plus consideration of process changes and expected improvements. But management was anxious not to make the first standards too tight (they have since been tightened) and it was emphasized that the standards were to be realistic, arrived at with the cooperation and consent of the supervisors with the responsibility for controlling the cost factors.

An operating supervisor was given the task of establishing cost standards for ingredients, operating labor, repairs labor, and power. He was assigned to the job for four months.

An accountant was given responsibility for establishing the procedure, designing the forms, setting standards for overhead charges, and bringing the system together. He was assigned to the job for six months, but the system was actually in operation ahead of schedule.

II. Setting the Standards

Cost analysis is divided into three sections:

—Ingredient costs.

—Plant-controlled costs: operating labor, repairs labor, maintenance materials, operating supplies, power, and plant salaries.

—Non-plant-controlled costs: overhead and prorated expenses.

Here are some of the most important standards:

• **Ingredients**—The important ingredients, fortunately, are consumed directly in proportion to production. Some of the less important ones, however, are not, and fixed monthly allowances were set for these.

Consumption of ingredients is determined by monthly inventory differences, and checked against the formula. Both standard and actual consumption are multiplied by the average ingredient price for the month. Dollar variances are noted, with strong emphasis on the expensive ingredients.

• **Operating Labor**—This is more or less fixed, since most of the equipment requires an operator. Consequently, the standards are based on an hour allowance per month.

In addition, there is a breakdown by supervisory area. For this purpose it was necessary to change the plant's labor cost code, which had formerly been accumulated by operating area.

A reasonable allowance was made for overtime, and for miscellaneous work done by the shift-breaking crew—the "fourth shift" workers who fill out the seven-day week. An allowance was also worked out for months with an off number of days.

The actual average wage rate during the month — including fringe benefits—is used to multiply both standard and actual hours.

Other plant-controlled costs were not as predictable as operating labor, and several standards were based on past experience—an hour allowance for repair labor, a dollar allowance for maintenance materials and for operating supplies, which were grouped into two standards for convenience.

• **Power**—It was extremely difficult to establish firm standards for water, steam, and electricity. But it was decided that tentative standards would lead to worthwhile analysis and discussion.

For steam, the standard is a fixed allowance up to a certain produc-

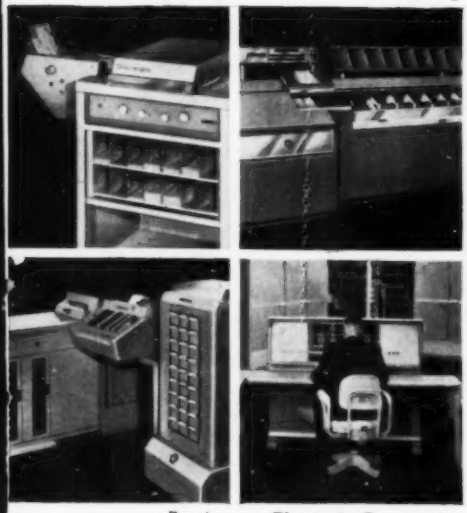
1234

MAGNETIC CHARACTERS ON CHECKS SIGNAL FORWARD STEP IN WORLD-WIDE BANKING AUTOMATION

The black magnetic-ink characters imprinted on bottom of check identify bank number, depositor's account number and amount of the check. Burroughs Electronic Sorter reads and follows the coded instructions at the rate of 1,500 checks per minute.

5678

Imprinting *Sorting*



Proving *Electronic Computation*

Burroughs Electronic Systems Key to High-Speed Banking

DETROIT—Automation in world-wide banking recently moved a long step closer to realization when the American Bankers Association announced its unqualified approval of "common language characters." These characters will be printed in magnetic ink on checks and other bank documents to speed their flow through electronic data processing systems.

The design of the new magnetic characters was selected, after several years of study, because of its universal applicability to the check collecting systems of banks everywhere. They can be read by anyone—and particularly well by Burroughs electronic machines.

The importance of this major step is emphasized by the fact that U. S. banks alone processed more than 10 billion checks in 1958, and must prepare for handling an estimated 20 billion in 1970! Corresponding increases in check usage are expected in many other areas of the world.

To meet this developing situation, Burroughs has just announced its "MICR (Magnetic Ink Character Recognition) Program" which encompasses a complete range of integrated systems and a comprehensive line of automation equipment, so that various sized banks may automate immediately *or* progress one step at a time.

Burroughs research and manufacturing know-how have gone into similarly intensive development of automatic data processing equipment for hundreds of other businesses and industries, including the U. S. Government.

Burroughs Corporation

INTERNATIONAL DIVISION, DETROIT 32, MICHIGAN

Offices in Principal Cities of the World

Mommy, what is caviar?

That's what Daddy eats on KLM!

What is KLM? The big Dutch airline Daddy likes!

Why Dutch, mommy? They are so friendly!

Won't Daddy be hungry? Not with KLM!

Do they have ice-cream too? Anything Daddy wants!

Can't I go too, mommy? Some day dear, by KLM!

KLM's worldwide network spans the globe, serving major cities in 74 countries on all six continents. For full information see your travel agent or the nearest KLM booking office.

tion level, above which a consumption factor is applied.

For electricity, there is a kilowatt allowance, plus a consumption factor—the higher the production level, the lower the factor used.

For water, the consumption factor is based on the average temperature of the water during the month.

III. Cost Analysis Report

On the cost analysis report, the total unit cost (total cost divided by total output) and the percentage of the total for each item are entered. Likewise, the standard unit costs for each item, and variances with the actual cost figures. This cost report originates in the plant and is completed in the front office.

The plant's office manager has specific responsibility for the cost analysis reports. A Ditto duplicating machine, with a "variable data" master sheet, produces 20 different reports in a half hour period.

The plant office accumulates data for ingredient quantities, operating labor, repairs labor, maintenance materials, operating supplies, and power costs.

The front office accumulates data on ingredient prices and overhead charges, which are prorated directly to each product (the company makes a total of 15 products).

Since the monthly cost report is completed before the official price and cost figures are available, a number of them are estimated. Experience has shown that these estimates seldom vary more than 1% from the true figures.

• **Heart of System**—The heart of the system, of course, is the comparison of actual costs with the standards. The supervisors are held responsible for the variances over which they have control. Management believes the secret of success is that the supervisors must meet standards they themselves helped to set.

At the monthly cost meetings, charts with important cost trends and cost standards marked with colored tape have been found most helpful. When corrective action is agreed on, specific responsibility for it is always delegated. (*The Controller, April, p* 174)

Financial Digest

The group of American security analysts who toured Europe last spring concluded that really heavy American investments in European securities are not likely in the near future, except in the international "blue-chip" stocks.

They noted that European securities markets are relatively thin, and large doses of American capital would thin the markets still further.

Another reason: The analysts found it difficult to get information on company affairs that they are used to getting from American companies. European companies tend to conceal their real earnings in special reserve funds. "As a result, their price-earnings ratios are extremely deceptive," one analyst told the *New York Journal of Commerce.*

The analysts were most favorably impressed by the potential of the French economy, however. "France could be the surprise of the next generation," one commented. They were also impressed with the new French law that requires all companies listed on the securities exchanges with over 1,000-million francs in assets to publish annual and semi-annual reports.

European investors are much more income-conscious and pay closer attention to dividend payments than American investors, according to the analysts. One reason is that dividend information is always available, whereas sales and income information is not. "Growth" companies are also judged on the basis of potential dividend action.

The relative low yields on the German markets is no exception to the "income now" tradition. The yields reflect the expectation of higher dividends as expansion programs taper off, and as a change in the tax structure results in a higher cash flow, freeing reserves for dividend payments.

There is a strong potential for long-term growth in consumer goods industries—and consequently, finance companies doing consumer credit business. In Germany, for instance, there are only 4 cars per 100 persons against 33 in the U.S.A.; there are 19/100 telephones, against 40/100 in the U.S. The security analysts see these "saturation gaps" as a great opportunity for the growth of European companies.

•

The highly controversial variable-annuity insurance policy —with benefits based on the value of common stocks—may become a reality. Last month, a bill permitting their sale was passed by the legislature of the U.S. state of New Jersey, and this could be a major breakthrough.

For the past five years, one U.S. insurance company, The Prudential, has fought to legalize this new kind of policy. Opposition has come from conservative insurance firms and the New York Stock Exchange, which argues that variable annuities should be treated as securities, not insurance.

Prudential contends that variable annuities will give policy holders protection against inflation in their retirement and a share in economic growth. In this role, they will complete with the thriving mutual funds.

The U.S. stock market will draw a massive infusion of new purchasing power from the variable annuity plans. And without doubt most of the buying will be concentrated in high-grade common stocks.

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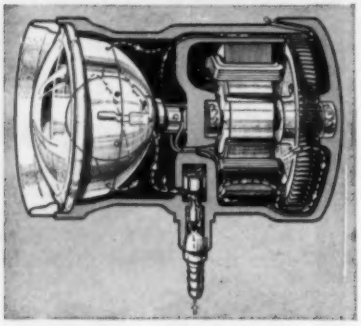

Air-Operated Safety Light

A safety lamp that is flame-proof, explosion-proof, portable, and requires no outside electrical source, has been developed in Sweden. The manufacturers say it will operate at any air pressure from 4.2 to 7 kg./sq. cm. A special reducing valve in the inlet (see sketch) keeps the turbo-generator working at constant speed in spite of variations in pressure in the primary air supply. Power is 12 volts, 150 watts. *Atlas Copco AB, Stockholm, Sweden.*

Dictation Over House 'Phone

With the A.T.E. Telephone Dictation Recorder correspondence is dictated over a normal 'phone extension, relayed to a remote recording machine, and transcribed in a typing pool. One of the system's chief features, claimed to be unique, is that although an ordinary house 'phone unit is used the final switches of the automatic telephone exchange are bypassed so that both dictation and normal calls are possible over the same system.

The user controls recording and playback with a small three-key unit connected to the 'phone. The system uses re-usable magnetic tape, has full range of audible and visual warnings. *Communication Systems Ltd., Norfolk House, Norfolk St., London W.C.2, England.*

For Faster, Safer Handling

A new control system, called Monotrol, is available on Hyster's Spacesaver 30, 40, and 50 lift trucks. which have power-shift transmission. Throttle and forward-reverse direction control are combined in one right-foot pedal, freeing the operator's hands for steering and load-handling. Dashboard pushbuttons for "park" and "drive" govern an automatic parking brake and engagement of the automatic transmission. *Hyster Co., 2902 N. E. Clackamas St., Portland 8, Oregon, U.S.A.*

Plastic Truck Body

A commercial truck body made of plastics, with integral framing and body panels, has come on the market. It is made entirely of glass fiber and polyester resins.

The two basic types of panel section, for sides and roof, can be built up to fit any length of chassis. The total weight of the plastic shell is about 65% lighter than the body of a similar, traditionally-constructed vehicle. *Salmesbury Eng. Ltd., Salmesbury, nr. Blackburn, Lancs., England.*

Heavy-Duty Crane

A portable floor crane has been designed for difficult lifting jobs. A self-locking winch holds the load at any height desired, and a retractable boom permits the use of attachments for removing and installing heavy engines, transmissions, dual wheels, etc. Capacity is about 1,800 kg, minimum reach 30 cm., maximum reach 1.05 meters, and lift 1.95 meters. Construction is of tubular steel. *Star Machine & Tool Co., 201 S.E. Sixth St., Minneapolis, Minn., U.S.A.*

In brief . . .

"Lindite", a new mineral-bonded coating for protecting steel, concrete, etc. is said to be smooth, marble-hard, and ageless. *Lindite Ltd., 14 Marshgate Lane, London, England.* . . . Palm-sized noise survey meter, for measuring noise hazards in industry, comes from *Mine Safety Appliance Co., 218 North Braddock Ave., Pittsburgh 8, Pa.* . . . Tiny 71-gram wireless microphone is available from *Aiko Electric Co., 4 Kanda Motosakuna-cho, Chiyoda-ku, Tokyo, Japan.*

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Management for the Smaller Company—written by top American businessmen—tells how sound management principles can be successfully applied to the very special problems of the smaller firm. Planning for future profit opportunities, solving specific marketing and manufacturing problems, and building a strong reserve of managerial talent are some of the subjects covered. 402 pages, $9.00. (American Management Association, 1515 Broadway, New York 36, N. Y., U.S.A.)

Bulletins from Industry

Delta's complete line of industrial metal lathes is described and illustrated in a new 20-page catalog. (Rockwell Mfg. Co., Delta Power Tool Div., 457 N. Lexington Avenue, Pittsburgh 8, Pennsylvania, U.S.A.) . . . The March issue of Lever magazine tells how Lewis-Shepard's Aislemaster fork truck solves warehousing problems. (Lewis-Shepard Products Inc., 125 Walnut Street, Watertown 72, Massachusetts, U.S.A.) . . . Brochure contains application and test data on KURE-N-SEAL, for curing, sealing and dustproofing newly-poured concrete surfaces. (L. Sonneborn Sons, Inc., 404 Fourth Avenue, New York 16, N. Y., U.S.A.)

Organizing a Personnel Program

Personnel Administration: Evaluation and Executive Control explains how to establish and maintain an effective personnel program for any size or type of organization. Step-by-step recruiting and hiring procedures are also covered. 305 pages, $7.00. (McGraw-Hill Book Co. Inc., 330 West 42nd Street, New York 36, N. Y., U.S.A.)

Tracing Technology

A History of Technology is the story of man's conquest of environment and his development of machines. The five volumes trace technological history from the Stone Age to the early 1900s. 888 pages, $23.50 per volume. (Oxford University Press, Amen House, Warwick Square, London EC 4, England.)

Investing Abroad

Joint International Business Ventures in Mexico—a case study of this country's investment opportunities—provides information on taxation, foreign exchange conditions, labor regulations and the legal aspects of foreign investment. $3.00. (Columbia University, Research Projects on Joint International Ventures, New York 27, N. Y., U.S.A.) . . . The Italian Investment Information Office is offering a booklet that provides information on setting up a business in Italy. (Italian Investment Information Office, 121 via Quattro Fontane, Rome, Italy.)

Measuring Work

Work Measurement presents the fundamental principles and techniques that are used to evaluate work standards, and tells how they can be applied to present day industrial problems. 203 pages, $4.85. (Reinhold Publishing Corp., 430 Park Avenue, New York 22, N. Y., U.S.A.)

YOUR Personal Affairs

Is Stereo Worth the Price?

Stereophonic recording has been going on for almost a year now, and stereo disks are becoming more plentiful. Most record companies plan to duplicate most releases in stereo and monaural recordings.

If you do not have any high fidelity equipment now, you are lucky, so far as stereophonic goes. For good stereo depends on matched equipment.

Ready-made packaged units are—at present—superior to separate units because they are factory matched and integrated. But even so, they are not perfect—the problem of "hum" has not been solved. Packaged stereo should cost you only about 20% to 30% more than for a single channel.

You can convert your present high-fidelity equipment to stereo, of course, by buying a second amplifier and speaker system. But remember the channels should be identical—the speaker systems, in particular.

And, of course, your present turn table and pickup will not play stereo (though stereo pickups will play standard recordings). Be forewarned that many of the "conversion kits" on the market are not good buys. For one thing, the stereo point is smaller than the LP point and requires much less pressure on the stylus. This means you should probably buy a new arm.

There is also the problem of "rumble," since stereo pickups respond to vertical as well as sideways vibrations.

In the last analysis, whether stereo is "worth it" depends on your own musical awareness. If you are careless with your records, or prone to damaging them, stereo will mostly add noise to your noisy recordings. On the other hand, it undoubtedly adds untold subtle values to fine music.

Now Hear This . . .

Many hard-driving executives, working under emotional strain, are psychologically prone to hearing defects. But some tend to shrug off poor hearing, others are sensitive about wearing hearing aids.

Yet doctors declare that the longer you postpone getting a hearing aid, the longer it will take you to learn to use one effectively. Sometimes the brain can become so conditioned to distorted sound patterns that normal sound seems confusing. This can complicate re-education and adjustment.

Chief causes of deafness are heredity, childhood diseases, repeated colds, head injuries, and otosclerosis. Advanced age may also impair hearing, as may some of the newer antibiotics or the over-use of nose drops.

The mechanical hearing aid has brought back sound to more people than surgery or other medical techniques. Three major types are in use:

—The conventional aid, with a box-like microphone-amplifier unit and a cord leading to an ear receiver. Although cumbersome, it has more power than smaller units and can benefit people with severe hearing loss.

—The eye-glass aid, built into the frames of the glasses.

—The over-the-ear aid, a tiny new gadget that fits snugly behind the ear. These small models, however, have two serious drawbacks: "Feedback" noises are bothersome, and their power is limited.

Whichever you choose, remember that few people like their aids at first. The adjustment period takes from a few days to as much as six months.

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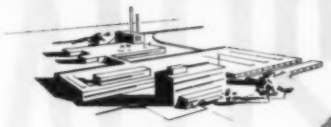

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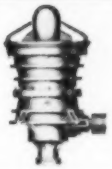

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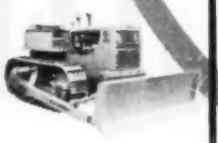

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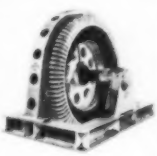

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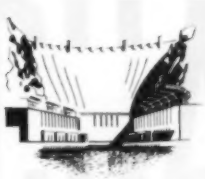

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